Model Scoping Plan and Report for the Tampa Bay Region Public Health Monitoring Project

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Executive Summary

Through its Brownfields Assessment and Redevelopment Programs, the City of Clearwater and the City of Tampa conducted a Tampa Bay Regional Public Health Monitoring Project. The primary purpose of the project was to develop a long term framework for monitoring the health of populations exposed to hazardous substances from brownfields sites and to ensure that brownfields sites are assessed and redeveloped in a manner that promotes community health, environmental protection, and economic vitality. The project explored the use of a variety of public health monitoring tools to identify the public health needs that may be addressed through brownfields redevelopment. Overall, the project identified and provided important opportunities to strengthen public health assets through brownfields redevelopment. Through a collaborative, community driven approach, the project produced the Model Screening Plan and Report for the Tampa Bay Region Public Health Monitoring Project (hereinafter referred to as PHM Project). This report seeks to educate and engage those who share the common goal of promoting community health through brownfields redevelopment.

Introduction

The link between brownfields redevelopment and community health has become firmly established. Environmental protection, health promotion, economic development and equitable governance are inextricably linked to each other and to the fabric of sustainable communities. Health is now recognized as a state of complete physical, mental, and social well-being of the individual, family and community. The environment is where people live, work, learn, play and pray. Economic development incorporates jobs, job training, purchasing power and a green economy. Equitable governance requires transparency, meaningful participation, and the right to participate in decisions that affect one's life. Ultimately, the social determinants of health, economy, environment, governance and community vitality are similar. A healthy population requires disease prevention and health promotion. A sustainable community requires jobs, education, transportation, affordable housing, a safe environment, and health care. None can thrive without the other. Brownfields redevelopment provides an unprecedented opportunity to leverage the common elements of these social determinants to promote community sustainability by improving community health, restoring contaminated sites, encouraging economic redevelopment, and engaging impacted people and health care advocates in decision-making.

As part of its EPA Brownfields Assessment activities, the City of Clearwater and the City of Tampa collaborated to undertake a public health monitoring project. The direct purpose of the project was to develop a long term framework for monitoring the health of populations exposed to hazardous substances from brownfields sites. Equally important, the project sought to ensure that brownfields sites are assessed and redeveloped in a manner that promotes community health, environmental protection, and economic vitality. This Model Screening Plan and Report for the Tampa Bay Region Public Health Monitoring Project (hereinafter referred to as PHM Project) seeks to educate and engage those who share the common goal of promoting community health through brownfields redevelopment. It provides a foundation for action by addressing core issues related to health promotion, economic development, and environmental protection. It captures the products of important activities required to engage the meaningful participation of diverse stakeholders, beginning with the impacted community. It presents a broad array of follow-up action to continue the process of achieving community health through brownfields redevelopment. It provides the foundation for action by identifying key participants and collaborators as well as sources of data and information. It strengthens the potential for success by identifying sources of support, including financial, philosophical and in-kind. Finally, it identifies the elements necessary to monitor the health of populations exposed to hazardous substances from brownfields sites.

Ultimately, the Tampa Bay Region Public Health Monitoring Project is a dynamic process, not a one-time, static event. It is an innovative effort engaging diverse stakeholders that bridges silos between levels of government, multiple agencies, private sector and community. Accordingly, the project is a response to the voice of those that bear the burden of pollution, disease, poverty and crime, and those who dedicate their lives to helping reduce and eliminate that burden.

Background on Brownfields Redevelopment and Public Health Monitoring

Challenges and Opportunities: In Florida, brownfields are defined as vacant or unused properties that are sites of real or perceived environmental contamination. According to EPA reports for the nation, contaminants commonly found on brownfields sites include petroleum, lead, volatile organic compounds, other metals, polycyclic aromatic hydrocarbons (PAHs), asbestos, PCBs, and controlled substances typically associated with methamphetamine labs. Brownfields reduce community health by posing challenges to personal safety, the environment, and social and economic prosperity. The broad impacts of brownfields on public health include:

- *Safety.* Abandoned and derelict structures, open foundations, or equipment compromised due to deterioration, controlled substance or 'meth lab' sites, or abandoned mine sites may pose safety risks;
- *Social and economic factors.* Blight, crime, reduced social capital or community 'connectedness', reductions in the local government tax base, and private property values that may reduce social services are all social and economic problems sometimes created by brownfields; and,
- *Environmental health.* Potential environmental dangers can be biological, physical, or chemical, and can be the result of real site contamination, groundwater impacts, surface runoff, migration of contaminants or wastes dumped on vacant sites.

Within the United States, there are populations of people who bear a burden of pollution, poverty, disease and crime. These populations are predominantly low income minorities affected by serious diseases and other health conditions at far greater rates than would be observed in other populations. Factors such as income, education, immigration status, and where a person lives can make the disparities more intense. Health disparities seen in brownfield communities include diseases such as asthma, cardiovascular disease, diabetes, infant mortality, and birth defects. Regardless of the causal link between exposure to pollution and adverse health effects, there is an urgent need to address the disease disparities common in this population.

Historically, the neighborhoods in which these people live were commonly overlooked by community development initiatives. This despaired status can lead to depressed economies and joblessness, substandard housing, increased crime rates, and limited access to adequate physical and mental health care and health promotion opportunities.

Brownfields redevelopment provides an important tool that can improve community health by addressing environmental concerns, eliminating safety concerns, and increasing green spaces. Redevelopment can provide sites for community health end uses *(e.g. health care facilities, community recreation centers)*; and help build a tax base to support health promotion services *(e.g. immunizations)*. In addition, the health status of individuals living in brownfield areas suggests a need for the development of new businesses and services for individuals living in these areas.

Finally, the particular challenges faced by brownfield residents may be exacerbated by or differ from similar communities unencumbered by pollution. Thus, areas with brownfields provide a defined geographic unit that can serve as logical sites to gather and analyze health data and health behaviors, incubate interventions, and evaluate the impacts of those interventions in a community setting. Brownfields thus represent an overlooked opportunity for ecological research, and applied public health research. As such, they are a valuable untapped resource for health programs and policy that can move our nation toward the elimination of disease disparity.

Public Health Monitoring: While many states had taken action in the 1990's to address brownfields redevelopment, federal action did not occur until 2002 when Congress passed the *Small Business Liability Relief and Brownfields Redevelopment Act* or Brownfields Law. This law expanded EPA Brownfields program funding levels and eligibility for brownfields assessment and cleanup support and sites eligible for funding. It provided new focus on the impacts of brownfields, particularly in disadvantaged communities and among sensitive populations. And, it strengthened opportunities to address public health issues associated with brownfields. One facet of this public health focus was the introduction of language that provides for local government recipients of brownfield grants to use grant funds for health monitoring. Specifically, the law provides:

> ***… a local government that receives a grant may use not to exceed 10% of the grant funds to develop and implement a brownfields program that may include 1) monitoring the health of populations exposed to one or more hazardous substances from a brownfield site; and 2) monitoring and enforcement of any institutional control used to prevent human exposure to any hazardous substance from a brownfield site.***

The Brownfields Law also allows state and tribal brownfields response programs funded under Section 128(a) to monitor the health of populations around brownfields sites as well as conduct other activities that help to establish and enhance their response program. There is no 10% limit on health monitoring for states and tribal response programs.

Since its adoption by Congress in 2002, public health monitoring has slowly been implemented by local governments. Tools used to date have focused on the adverse effects of brownfields. Efforts completed by communities across the nation to implement the Brownfields Law public health monitoring provisions include:

- lead screening at child care facilities
- asthma surveillance study
- planning and visioning to achieve optimal health reuse of brownfields
- health care clinics
- examination of site access patterns to determine pathways of contamination
- mapping of site features that affect human exposure (e.g. private wells)
- monitoring health as part of community wide inventory activities
- collection of baseline health and environmental measures for planning
- monitoring of air, soil, and water during cleanup, reuse and long term stewardship
- examination of vital statistics in areas near brownfields sites
- assessing community progress in meeting Healthy People 2010 objectives

In Florida, there is growing recognition by local governments, community based organizations, health care providers and the private sector that the focus of public health monitoring should be expanded beyond the negative impacts of brownfields sites to include positive impacts from brownfields redevelopment. An important illustration of the need to consider both the negative impacts of brownfields and the positive health impacts of brownfields redevelopment is the Willa Carson Community Health Resource Center. This free community health center is the first free health center established in Florida using the state's brownfields program. It has served to increase access to health care for minority and low income populations, and to collect data and information that helps document the benefits of brownfields redevelopment. See http://www.epa.gov/brownfields/pdf/ss_clear.pdf.

Ultimately, the background of brownfields and its relationship to public health provides a framework for the Tampa Bay Region PHM Project. This framework strongly suggests that the application of brownfields redevelopment in addressing the public health of regions should consider the nature of the population living in areas with brownfields, the opportunities provided by brownfields redevelopment, and specific applications of the public health monitoring provisions of the federal Brownfields Law.

Purpose and Goal of the Public Health Monitoring Project

As components of the City of Tampa and the City of Clearwater's Brownfields Programs, the specific purpose of the Brownfields PHM project is to implement the public health monitoring provisions of the Brownfields Law. Yet, the overarching goal is much broader: to ensure that brownfields sites are assessed and redeveloped in a manner that promotes community health, the environment and the economy. Altogether, this purpose and goal recognize the full life cycle of brownfields redevelopment, which includes site identification, assessment, remediation, reuse and redevelopment. They also acknowledge the important components of construction and operation of the end use of the redevelopment. Finally, they incorporate long term stewardship of the property to ensure that the mechanisms for protecting human health and the environment remain intact.

Within this context, the objective of the Brownfields PHM project is to develop a framework that will advance and capture the benefits to public health from the Brownfields program operated by both cities. An understanding of these benefits will help strengthen the implementation of the Brownfields program and improve the health of populations living in areas with brownfields sites. To achieve the overarching goal of the project, important elements of success have been identified, which are provided below.

> **Health:** Identify the health challenges in the community that may be addressed through brownfields redevelopment. These include health disparities such as diabetes, cardiovascular diseases, cancers, and adverse birth outcomes, among others. Identify measures to overcome these challenges by increasing access to health care and promoting disease prevention strategies.
>
> **Planning:** Serve as an instrument to guide the process of solving current challenges and preventing new ones. Provide a template to guide decisions by local decision-makers.
>
> **Capacity Building**: Capture information serving as a basis for securing resources to implement projects that overcome challenges. This information can be used in developing grant proposals and in seeking other support, both financial and in-kind.
>
> **Evaluation:** Compile data that can be used as benchmarks for evaluating efforts on both short and long term bases. Document progress that has been achieved through the process of developing the plan of action.
>
> **Networking:** Determine the range of stakeholders that are essential to the resolution of challenges, both in terms of identifying problems and solutions. Document current stakeholders and partners and identify potential collaborators.

Ultimately, the purpose, goals and objectives served as beacons and milestones for the implementation of the PHM Project.

Methodology and Activities

Fundamentally, the PHM Project was a community based collaboration established to address the public health monitoring provisions of the federal Brownfields Law. In that vein, it incorporated core elements of community based participatory research which are population driven and incorporate community involvement.

At the outset, an innovative, multi-stakeholder team was developed to design and implement the PHM Project. For the City of Tampa, leadership was provided by Ed Johnson and Lorna Alston with the East Tampa Development Department. For the City of Clearwater, leadership was provided by Dianne Hufford of the Economic Development and Housing Department. Working under the auspices of the City of Clearwater and the City of Tampa, TBE Group, Inc. was retained as the lead consultant, and Miles Ballogg served as the project director. He retained the services of additional brownfields experts. These included B. Suzi Ruhl, an environmental lawyer and epidemiologist, who also served as the project director, Robert Brinkman, Professor of Geography, who led data management and mapping efforts, and Patrick Barnes, lawyer and engineer, who focused on job training.

The project team developed a comprehensive and unique strategy to achieve its goals. Activities that were undertaken included research and analysis, frequent meetings with core team members, facilitated dialogues with key stakeholder groups, front-end community outreach and listening sessions, networking among stakeholders, and educational and visioning workshops. The methodologies, activities and accomplishments are discussed more fully below.

Research and Analysis: The initial phase of the PHM project involved research and analysis of a broad range of issues to develop a strong foundation for action in the Tampa Bay Region. Research was conducted through literature reviews and interviews with stakeholders to develop a baseline for existing data and information which can be used to develop and implement a public health approach to brownfields redevelopment. The categories of data and information addressed include: types of public health monitoring projects undertaken by local governments across the country; types of projects undertaken through the Agency for Toxic Substance and Disease Registry (ATSDR) brownfields program; identification of national data sources; identification of state data sources; identification of data sources that are based on local information; surveillance opportunities to expand data and information regarding community health issues within brownfields areas; indicators used to measure health impact from both brownfields and brownfields redevelopment; and, alternative measures to evaluate indicators.

The first area of focus was on the health, technical and legal research of existing efforts to implement the health monitoring provisions of the Brownfields Law. The analysis addressed approaches to implement the health monitoring provision, indicators used to measure health impact from both brownfields and brownfields redevelopment, alternative measures to evaluate indicators, and types of potential collaborations. The second area of focus was on interviews with federal and state government officials and academic professionals on existing efforts to implement the health monitoring provisions of the Brownfields Law. Issues addressed included approaches to implement the health monitoring provision, indicators used to measure health impact from both brownfields and brownfields redevelopment and alternative measures to evaluate indicators. The third area was to identify and engage

potential collaborators within federal and state government, academia, health care providers, non-government organizations, private foundations, and others. The fourth area was research and analysis of sources of data addressing community health issues. These data sources address population demographics, health disparities, vital statistics, contamination, and land uses, among other topics. The fifth area involved the assessment of the role of local and state health departments in brownfields development through research and roundtable dialogues. The sixth area involved research of funding sources to support community health brownfields redevelopment projects.

Assessment and Integration of Public Health Surveillance Programs: The PHM Project undertook a significant effort to research and identify population data sources relevant to the City of Tampa and City of Clearwater. Population data included disease disparities, health status, access to health care, health promotion and disease prevention capacity, and cumulative risk factors. Because of the significant costs associated with "sua sponte" data collection, this project also sought to identify collaborative efforts by investigating existing sources of health data and existing efforts to gather data. Sources of data exist within federal (e.g. Centers for Disease Control and Prevention), state (e.g. Florida Department of Health) and local government (e.g. Hillsborough County Health Department); academia (e.g. University of South Florida); non-profit institutions; and the private sector. For a description of identified health data sources, see the Section on Sources of Data.

Outreach: Transparency and meaningful public involvement served as a fundamental tenant of the PHM Project. Key outreach activities were undertaken throughout the project, which are described below

Facilitated Dialogue for the City of Clearwater

On September 17, 2008 a Facilitated Dialogue was held at the Clearwater Library for community health care providers, hospital representatives and other public health advocates. The purpose of the Facilitated Dialogue was to:

- Introduce the City of Clearwater's Public Health Monitoring Project
- Listen and learn from health care leaders about the area's health challenges and resources
- Identify next steps to improve public health through brownfields redevelopment

The Facilitated Dialogue was comprised of two parts. The first part provided an overview of brownfields redevelopment, highlighted successful community based brownfields redevelopment projects, and explained the public health monitoring project. In fact, The City of Clearwater is a national leader in this area, having established the first free health clinic serving disadvantaged populations in the State's first designated brownfields area. The PowerPoint presentations on these topics are provided as Appendix D. The second part involved a discussion designed to gain insights from public health and medical leaders about health challenges faced by communities in Clearwater, including disease burdens, environmental concerns and redevelopment interests. Ultimately, the Facilitated Dialogue sought to engage the community health sector in efforts to plan and implement the PHM project of the City of Clearwater's Brownfields Program.

Community Listening Session for East Tampa

On September 18, 2009, a Listening Session was held at the Community Center at Ragan Park to collect information from community leaders and residents about their concerns and visions regarding community health and sustainability and to inform them about the use of brownfields redevelopment to address their concerns. The Listening Session also provided the opportunity to acquire local information; illicit the participant's responses to questions about health, environment, and brownfields; gather insight and feedback on preliminary findings from the research. Ultimately, the purpose of the dialogue was to engage the public from the East Tampa area in order to better plan how to focus a project on health monitoring as part of an EPA grant received by the City of Tampa's East Tampa Redevelopment office and increase the capacity of community based health advocates to be part of brownfields health monitoring.

PHM Caucus at the Florida Brownfields Assocation (FBA) Conference

To share information developed through the Tampa Bay Regional Public Health project, and to gain additional insights, a PHM Caucus was convened at the FBA conference held in St. Petersburg, FL in October, 2008. Participants included representatives from the US EPA, FDEP, Hillsborough County, Pinellas County, several environmental consulting firms, academia, and non-profit organizations.

Presentation and Dialogue with the Clearwater Brownfields Advisory Board

The PHM team for Clearwater and representatives from the U.S. EPA Region 4 met with the City of Clearwater Brownfields Advisory Board in October, 2008. The purpose of this meeting was to explain the goals, objectives and methods of the PHM project; to secure comments, insights and recommendations of the Board; and, to engage the board in the implementation of the project.

Community Dialogue

Members of the PHM Team from East Tampa, representatives from Clearwater, and federal and local government officials met with community leaders in East Tampa in October, 2008. The purpose of the meeting was to gain insight on community health, determine environmental and economic challenges, assess current capacities to address those challenges, and develop a vision of brownfields redevelopment that ensures community health and well-being.

Engagement of Local Health Departments

Given the important and evolving role of the local health departments in leveraging brownfields redevelopment to promote community health, the PHM team dedicated significant effort to engaging both the Pinellas County and Hillsborough County Health Departments. In addition to numerous conference call dialogues, members of the PHM team met with staff of each health department at the respective department offices. The team provided background information on the project and clarified the legal authority in Florida for health departments to address brownfields redevelopment issues. Then, the team and department staff addressed barriers for engagement of health departments in brownfields redevelopment. Finally, the group discussed opportunities for health departments to advance their core mission and duties through brownfields redevelopment.

Facilitated Dialogue with Health Agencies

In January, 2009, a facilitated dialogue was conducted via conference call entitled *Advancing the Role of the State and Local Health Department in Brownfields Redevelopment: Demonstration Efforts in Clearwater and East Tampa*. Participants in the call included representatives from ATSDR, FDOH, the

Hillsborough County Health Department and the Pinellas County Health Department, City of Clearwater, East Tampa Development Department, Florida Brownfields Association, and TBE Group, Inc. The goal of the dialogue was to promote the role of health departments in community driven brownfields redevelopment. Specific objectives were to 1) identify interests of the health department (state and local) that can be promoted through brownfields redevelopment, and, 2) determine the capacity of the health department (state and local) to participate in brownfields redevelopment. Based on the dialogue, several roles for health departments were identified. They included participation in public health monitoring, risk communication, disease prevention and health promotion for both chronic and acute diseases, and serve as data sources that can be used in brownfields redevelopment. The role of ATSDR in assisting health departments was also discussed.

Conference Call Roundtable Dialogues

A series of roundtable dialogues were convened with interested stakeholders through conference calls and in person. The purpose of these dialogues was to: 1) increase understanding of the value in conducting health monitoring specifically in a community health Brownfields redevelopment approach; 2) increase understanding of community health concerns for populations living in areas with brownfields sites; 3) review and expand the proposed health indicators that are relevant to the needs of the City of East Tampa; 4) develop a framework for the application of the public health monitoring template; 5) identify action steps that would address community health concerns through brownfields redevelopment; and 6) establish a team of interested stakeholders who can participate in the implementation of the template. The dialogues produced a workshop planning committee with a broad and diverse group of stakeholders.

Youth and Job Training Exercise: The PHM Project operated under the premise that *all work and recovery in Brownfield communities sponsored by the EPA and its various grants and funding programs must include tangible job training.* Furthermore, job training in brownfield communities cannot and should not be limited to environmental site assessment and remediation. Accordingly, the PHM Project sought to actively engage youth from the East Tampa community in the health assessment of their community through a pilot program. While this element was not funded, it was critical to engage youth and to leave them with employable skills for the broader environmental industry.

The purpose of the Geographical Information Systems (GIS) job training pilot was to provide youth within the Brownfields project study area with an introduction to GIS and its application within the environmental sciences and community planning field. The objectives of this introductory level training were:

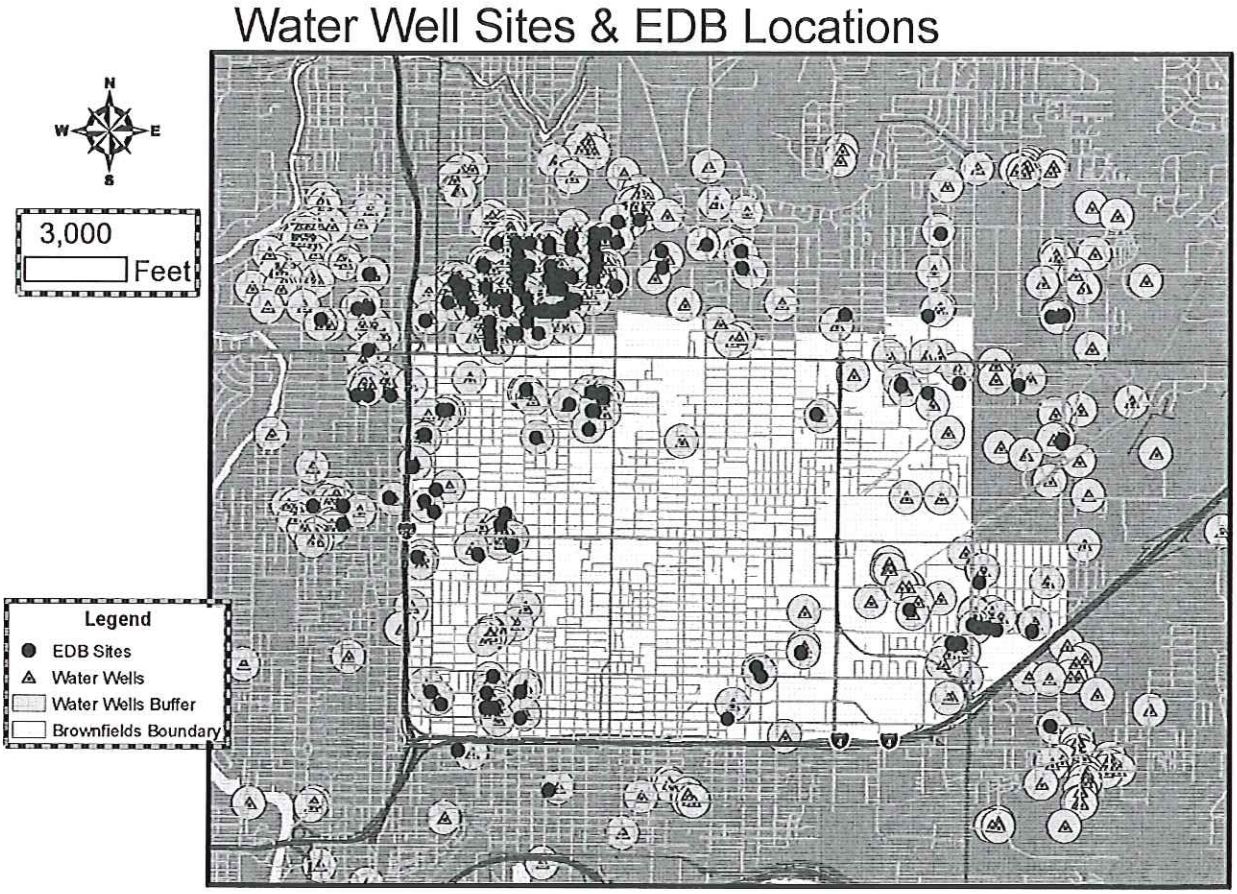
- Explanation of GIS and its utilization in a variety of industries and government;
- Explanation of GIS capabilities as a management tool for problem solving, conducting business, and planning for the future;
- Demonstration and explanation of the basic features of GIS;
- Demonstration and explanation of how to use GIS to obtain information and create meaningful maps;
- Administration of interactive exercises to develop a working knowledge of GIS; and
- Development of a GIS map by the students.

Seven students from the East Tampa Bay area attended the GIS training program. These students were from Jefferson High School, Armwood High School, Middleton High School, and Tampa Bay Tech School. The training was provided by two environmental engineers from Barnes, Ferland and Associates (BFA Environmental) and supported by representatives from the Heart of East Tampa Front Porch Council. Four, two-hour evening/weekend sessions were held to conduct this training.

The general explanation of GIS provided an overview of its fundamental concepts. GIS is computerized interactive mapping, which displays information, thus enabling users to see and manage the world in entirely new ways. Within GIS, information is categorized in "layers" and displayed in various combinations to create thematic maps. GIS is an analytical tool. It is used to analyze data and help make informed decisions. GIS has applications in government, private industry, science and education. GIS is an emerging industry and an important analytical tool for the future. It is paramount that today's youth are familiarized with the fundamentals of GIS.

Students were provided interactive learning exercises during the GIS training module. Students were provided with workstations so that they could have a hands-on learning experience with GIS software. The initial sessions focused on basic GIS concepts (geographic coordinates, geometric shapes, databases, layers and spatial relationships). The closing sessions focused on thematic map creation, simple database queries and data analysis. GIS data from the local Tampa area were used during learning exercises (population statistics, health care facilities, social data and environmental data from East Tampa Brownfields). Ultimately, the students were challenged to use GIS data from the East Tampa area to develop their GIS thematic map.

Example of Student GIS Thematic Map



The Heart Of East Tampa Front Porch Council Inc,

Regional Workshop in Clearwater

An evening workshop was convened in February, 2009 through the City of East Tampa and the City of Clearwater. The purpose of the workshop was to educate and engage interested stakeholders in the implementation of the health monitoring provisions. The workshop also served to provide background information on brownfields in general; highlight on-going efforts to address environmental, safety and health threats posed by the brownfields sites; profile resources, including foundation grants, to address challenges to community health; discuss potential approaches for promoting community health through brownfields redevelopment; and identify measures to achieve goals and objectives. Almost fifty community leaders, health care providers, businesses, government officials, and others participated in the event.

Regional Workshop in East Tampa

A full day workshop was held in February, 2009 at the Ragan Community Center in East Tampa. The purpose of the daylong workshop was to help community leaders, health advocates and providers, non-profit organizations, government, academia, private sector interests, and others interested in community revitalization:

- Learn about ongoing efforts to promote community health by leveraging brownfields redevelopment;
- Network with leaders in community health, neighborhood revitalization, government, business and philanthropy throughout the Tampa Bay Region; and
- Identify and engage potential sources of resources in addressing community health challenges.

The dynamic, interactive and innovative workshop served to educate and engage all those committed to community revitalization through brownfields redevelopment by 1) providing education on how brownfields redevelopment can be used to promote community health and economic revitalization; 2)presenting a draft Plan of Action to achieve community health goals; and, 3) involving participants in dynamic discussions on taking action to transform common health, and environmental and economic challenges into opportunities that restore community vitality. Almost 100 individuals participated in the event.

For related information on the workshops [e.g. agenda, planning committee, sponsors, ect), see Appendix E.

Model Plan Development: The information developed through the PHM Project and included in this document function as a model scoping plan. This plan provides the framework for promoting community health through brownfields redevelopment and incorporating the health monitoring provisions of the Brownfields Law. The process has been iterative and dynamic throughout the entire period of the project, allowing the plan to reflect the issues and challenges of interest to the local stakeholders, and opportunities to address those challenges through brownfields redevelopment. A significant component of the process is collaboration with USF Department of Geography and Center for Brownfields. The Center has undertaken data collection and mapping efforts for brownfields sites and local health statistics in support of PHM objectives.

Ultimately, the PHM Project has served as a framework for measuring the health impacts of brownfields and for capturing the benefits of brownfields redevelopment. Informed by the activities and accomplishments throughout the project, the scoping plan includes recommendations for follow-up activities in the areas of public health, environmental protection, and economic development.

Accomplishments of the Public Health Monitoring Project

The Tampa Bay Regional PHM project accomplished many objectives, which will serve to provide an important foundation for future actions to promote community health through brownfields redevelopment. First, the project engaged a broad group of diverse stakeholders that represented community organizations, government at all levels, health care providers and advocates, businesses, and academia. This collection of stakeholders achieved racial, cultural, gender, age, and income diversity. Second, the project produced a dialogue between health care agencies at the local, state, and national levels. It also produced a dialogue between environmental and health agencies at all levels of government. Third, it integrated health care training with brownfields redevelopment through job training activities on brownfields and on health care.

The project produced the following deliverables: 1) Catalogue of Health Monitoring Approaches; 2) Team of Stakeholders Engaged in the Health Monitoring Process; 3) Potential Collaborators to Implement Health Monitoring Provisions; and 4) Identification of Potential Resources to Implement Recommendations. These components are compiled as part of this Model Regional Health Monitoring Plan for the City of Tampa and City of Clearwater.

Specific outcomes were achieved by the project which include:

- Identification of public health interventions on remediated and redeveloped brownfields sites and a process to measure the impact of these interventions on public health;
- Determination of potential sources of capacity and resources to implement the interventions;
- Development of a collaboration of diverse stakeholders to implement the interventions;
- Strengthening of the role of health departments (ie state and local) and federal health agencies in brownfields redevelopment; and
- The demonstration of a national model for a community health brownfields redevelopment approach.

The project also produced a series of findings and guiding principles:

- Public health is an important foundation for ensuring commuity healh and sustainability through brownfields redevelopment.
- When the community is engaged early in the process it creates a more informed constituency that can engage in positive exchanges with diverse stakeholders and promote collaborative problem solving.
- The local community should develop its own goals and vision that can help shape the larger vision.
- Local, State and Federal governments are important resources that are essential for success.
- Public support is essential for those seeking to promote community health in general and through brownfields redevelopment in particular. This capacity extends beyond the resources available for brownfields site assessment and remediation. It includes construction, operation, and long term sustainability. Stakeholder support is especially crucial for community based organizations.

- Sources of capacity include partnerships with the private sector, including the health care industry; private foundations; government grants, contracts and cooperative agreements; and private capital investment.
- There is significant synergy between the challenges and opportunities between community organizations, non-profit groups, academia, private sector, and government at all levels. The focus of community health through brownfields redevelopment can serve as an important bridge between unconnected sectors.

Ultimately, the PHM Project secured community recognition and support for the principle that community health benefits from brownfields redevelopment through:

- site assessment and cleanup of abandoned properties;
- elimination of safety concerns (e.g. pits, abandoned structures);
- increase in green and open spaces (e.g. community gardens);
- redevelopment of sites into land uses that promote community health and well-being (e.g. health clinics, recreational centers);
- increased tax base to support community health ;
- job training and employment opportunities;
- full participation by community residents in government and business decisions affecting cleanup and reuse of brownfields;

Barriers and Solutions: Stakeholder Findings and Recommendations

Based on input garnered from community meetings and workshops, the following chart on barriers and solutions regarding brownfields redevelopment was generated.

Barriers	**Solutions**
Environmental	
Unsafe neighborhoods: crime, unwalkable communities	Sidewalks, lighting, parks, recreation (eg biking, tennis, basketball courts)
Sprawl, reliance on automobiles	Transit oriented development; rails to trails
Contamination of waterbodies	Remediation of contamination source, pollution prevention measures
Vacant properties with modest contamination	Cleanup of site; reuse in manner that supports community needs
Air pollution	Evaluate relationship to brownfields
Hazardous waste by local businesses	Amnesty Day for waste management
Health	
Fast food restaurants	Community gardens, farmers markets
Access to health care (primary, dental, mental)	Use of brownfields for health care sites; leverage brownfields funds to support community health centers; form partnerships with hospitals
Lack of data and information on extent of health problems	Engagement of federal, state and local health departments; access Agency for Health Research and Quality; screening programs in brownfields areas
Chronic diseases: diabetes, asthma	Prevention programs; mobile clinics
Economic	
Lack of youth opportunities	Link with high school programs, Boys & Girls Clubs, Youth for Elderly programs
Need for job creation	Link brownfields with health care field and trainers
Need for training and education for disadvantaged populations	Partner with academic institutions for core education; special focus projects; tutoring and mentoring
Short term nature of brownfields remediation jobs	Relate brownfields training to other community needs (e.g lead abatement)
Community Engagement	
Lack of community organization capacity	Provide grants for capacity building; promote partnerships between community groups and other institutions
Lack of awareness of brownfields opportunities	Work through local organizations, churches, health organizations
Lack of youth involvement	Create programs (e.g. Girl Scout badge); tie to school curriculum

Partners, Stakeholders, and Collaborators

The Tampa Bay Regional PHM Projects have been sustained through the robust participation of numerous essential stakeholders representing the community, government and private sector. These collaborators are described below according to category.

Community Based Organizations

East Tampa Community Revitalization Partnership: This partnership is a volunteer advisory council to the board of the City of Tampa's Community Redevelopment Agency. Groups like ETCRP provide ongoing guidance and input to the CRA, sharing community insight in the board's pursuit to improve the quality of life and economic vitality of the city's urban districts. The advisory council offers recommendations relating to the redevelopment area and it is the CRA board that adopts redevelopment plans, budgets, and provides direction to city staff operating within each individual district. CRAs are a unique way of leveraging public funds to stimulate private sector redevelopment of urban areas like East Tampa.

Community Health Advocacy Partnership (CHAP): Community Health Advocacy Partnership's mission is to advocate, promote, and protect the health and safety of community members, including minorities, underinsured and underserved individuals and families in Hillsborough County, Fla. CHAP's main strategies for accomplishing its mission include facilitating access to quality health services, integration of community disease prevention, intervention and education, case management, advocacy programs and forming strategic partnerships with complimentary public and private entities. CHAP.'s vision is that "all residents of Hillsborough County live well and have access to resources needed to ensure wellness across generations. As a community-based and community-focused organization, we are committed to providing convenient access to quality health care services where people live, learn, worship and play." It was founded in 2003.

Bay City Elks Lodge: This is a community-based organization that is involved in efforts to promote community vitality through a variety of mechanisms.

Heart of East Tampa Front Porch Council (HETFPC): HETFPC was established in 2002 as part of the State of Florida's Front Porch Initiative. The Front Porch initiative is a grassroots approach to revitalizing communities throughout Florida. It focuses on families, empowering them to identify and resolve neighborhood problems. The HETFPC has played a major role in revitalizing the East Tampa community focusing on economic and health well-being. http://www.tampagov.net/MayorProclamations/20070412_Heart_of_East_Tampa_Outreach_Volunteers_Day.pdf.

Non Profit Organizations

Environmental Law Institute (ELI): ELI, a global leader in protecting the environment through law, policy and management, provides information services, advice, publications, training courses, seminars, research programs and policy recommendations to engage and empower environmental and community leaders. ELI is widely recognized for its expertise in

state and federal brownfields programs. Its online Brownfields Center (www.brownfieldscenter.org) brings together a wide array of resources designed to increase collaboration to ensure tangible benefits to community health and the environment. ELI's Brownfields and Public Health Initiative is a major campaign to ensure long term community sustainability by integrating public health with economic development, environmental protection, and equitable governance. Through this initiative, ELI seeks to improve the well-being of low-income populations and people of color who bear the dual burden of pollution and disease. ELI is leveraging the Nation's interest in redevelopment of contaminated sites and promotion of community health centers to produce tangible health benefits for people living in areas with brownfields.

Florida Brownfields Association (FBA): The FBA is a non-profit, volunteer, service organization dedicated to assisting in the advancement and implementation of the Florida and National Brownfields Redevelopment programs. Working in cooperation with the U.S. Environmental Protection Agency (USEPA) and the Florida Department of Environmental Protection (FDEP), the FBA is an assembly of environmental specialists, professionals, government. academia, and community leaders who provide brownfields information and redevelopment strategies to communities and the public at-large in the interest of cleaning up contaminated properties and revitalizing areas that have been subject to economic decline. The FBA goals and agendas address the needs and desires of the State of Florida and its communities with reliance on the expertise provided by members in a wide variety of brownfields domains.

Government

US EPA Region 4: EPA's goal is to protect human health and the environment. EPA's Region 4 covers eight (8) southeastern States, including Florida. Its Regional Revitalization program serves these states, local municipalities, consultants, developers, financial institutions and the community at large to assist in the clean-up of contaminated properties and subsequent redevelopment of the site. The Revitalization program seeks to achieve this mission by addressing contaminated sites arising out of Superfund, RCRA, Underground Storage Tanks, Federal Facilities and Brownfields programs. It promotes partnership of EPA with other organizations to help identify possible funding and technical assistance which can be found to address the effective end use of the property as seen by the local community's vision.

Agency for Toxic Substances and Disease Registry (ATSDR): ATSDR is a federal health agency of the U.S. Department of Health and Human Services. ATSDR is directed by congressional mandate to perform specific functions concerning the effect on public health of hazardous substances in the environment. It is part of the U.S. Center for Disease Control and Prevention, which is charged with tracking and investigating public health trends. The overall mission is "to promote health and quality of life by preventing and controlling disease, injury, and disability."

Florida Department of Health (FDOH): The mission of the FDOH is to promote, protect and improve the health of all people in Florida. The Department operates at the state and county levels. At the state level, the department operates a Division of Environmental Health. Activities of this division include efforts to: regulate 70% of Florida's population's drinking water; inspect

and regulate 2.3 million onsite sewage treatment and disposal systems, serving 30 percent of Florida's population; implement an Environmental Public Health Tracking (EPHT) programs in concert with Center for Disease Control and Prevention to link health information on asthma, birth defects, cancers and developmental disabilities with environmental health data using Geographic Information System (GIS) technology; and, implementing the Protocol for Assessing Community Excellence in Environmental Health (PACE-EH) projects which enable 21 Florida counties to tackle pressing environmental health concerns as a part of a community-based effort. County Health Departments provide most of the public health services in Florida. Services are provided through a partnership between the state, district offices, and the counties. Services include disease control, primary care and personal health services, emergency medical services, pharmacy services, and laboratory services.

Florida Department of Environmental Protection (FDEP): The FDEP is the lead agency in state government for environmental management and stewardship that seeks to protect Florida's air, water, and land. The Department is divided into three primary areas: Regulatory Programs, Land and Recreation and Planning and Management. Florida's environmental priorities include restoring America's Everglades, improving air quality, restoring and protecting the water quality in our springs, lakes, rivers and coastal waters, conserving environmentally-sensitive lands and providing citizens and visitors with recreational opportunities, now and in the future. The Brownfields Redevelopment Program empowers communities, local governments and other stakeholders in economic development to work together to prevent, assess, clean up, and reuse brownfields.

Local

Environmental Protection Commission of Hillsborough County: The Environmental Protection Commission (EPC) was delegated the administration of the Brownfields Program in Hillsborough County, effective June 15, 2004. EPC has participated as an interested party in the Brownfields program to date and has the expertise and resources to successfully administer the program within Hillsborough County. The FDEP and EPC believe that authorizing the local program to negotiate Site Rehabilitation Agreements and oversee the environmental cleanup of brownfields will facilitate expansion of the program within the County. The designation of brownfield sites in unincorporated Hillsborough County and the revolving loan fund continues to be implemented by the Planning and Growth Management Department of the County Administrator's office. The designation of brownfield sites in the City of Tampa remains with the City's Office of Environmental Coordination. The ERC submits an annual report to the FDEP that identifies important information on brownfields sites, including site location, size, maps, use of alternative cleanup target levels, engineering and institutional controls (i.e. Site Rehabilitation Completion Order), and redevelopment information (e.g. jobs created, capital investment).

Health Care Providers

Willa Carson Health Resource Center: The Center's mission is to provide culturally sensitive, quality health care to the uninsured and under-served residents of the North Greenwood community. Services are all provided free. This center is a non-profit volunteer organization. The health care volunteers are dedicated to assisting the family medical needs of all regardless of race, color, creed, national origin, ancestry, sex, marital status, disability, religious or political affiliation, age, or sexual orientation. This community health center is the first free health center created in the state of Florida's first designated brownfields area. This center provides free primary health care to residents of the North Greenwood community, and others who are uninsured and underserved. It also provides screenings, vaccinations, and educational programs.

Tampa Family Health Centers (TFHC): This federally qualified health center is a not-for-profit organization that has been providing quality and affordable primary health care to residents of Hillsborough County since 1984. TFHC was borne from a grass roots effort of concerned citizens within the community who came together for the purpose of providing accessible, comprehensive, and continuous health care. In 2006, TFHC furnished over 67,000 patient visits for 21,000 residents of Hillsborough County. At the present time, TFHC operates eight health care delivery sites and one mobile medical van. In addition to the pediatric, family practice and internal medicine services furnished at all sites, three of the centers operate dental clinics, four have on-site pharmacies, and one is equipped with an X-ray department. TFHC works very closely with schools, shelters and faith-based organizations by providing outreach and educational projects within the community.

Clearwater Free Clinic (CFC): The CFC is a volunteer driven non-profit, non-government medical facility that provides problem-oriented, primary health care to the low-income and uninsured population living in Clearwater and surrounding communities. This center services approximately 12,000 people/year and addresses health maintenance, with a special focus on chronic disease (e.g. diabetes). It uses client care workers. The majority of the patients at the CFC are hard working people with limited incomes or low paying jobs. Their income excludes them from receiving government assisted programs yet prohibits their ability to afford private healthcare or insurance.

Homeless Emergency Project (HEP): For over forty years, HEP has provided homeless people, homeless children, and low-income individuals and families with housing, food, clothing, and support services necessary to obtain self-sufficiency and improved quality of life.HEP is a registered 501 (c)(3) charitable organization. Its mission is to provide homeless and very low-income individuals and families with housing, food, clothing and support services necessary to obtain self-sufficiency and improved quality of life. HEP is the oldest and largest provider of emergency housing and support services in Pinellas County. Through the provision of emergency, transitional and permanent supportive housing, HEP provides lasting solutions to ending homelessness in our community. As part of their mission to help the homeless, HEP operates a 269-bed facility where emergency and transitional housing is provided for the temporarily homeless as well as permanent supportive housing for mentally disabled individuals and families. In partnership with Morton Plant Hospital and Pinellas County Human Services, HEP also offers a wide range of on-site medical and mental health services for its clients.

Academia

University of South Florida (USF) Center for Brownfields Rehabilitation: The USF Department of Geography houses the Center for Brownfields Rehabilitation. Overall, the mission of the Department of Geography is threefold: 1) to conduct basic and applied research; 2) to provide exceptional, quality education and professional development opportunities at the undergraduate and graduate levels; and 3) to serve the region, community, and the university. Teaching and research themes focus on: (i) Environmental Processes and Policy, (ii) Environmental Hazards, Sustainable Communities, and Vulnerability Assessment, (iii) Geographic Information Sciences, (iv) Globalization and International Development, and (v) Urban and Regional Development and Planning.

Private Sector

TBE Group, Inc: TBE is a world leader in promoting community health through brownfields redevelopment. The firm specializes in turnkey brownfields redevelopment services for blighted areas where real or perceived environmental contamination issues have resulted in underutilized properties. TBE has core competencies in coordination of major infrastructure projects, particularly in the areas of utility mapping, utilities coordination, right-of-way acquisition and relocation, transportation engineering, construction engineering, and civil and environmental engineering. Government agencies and private contractors utilize the services of TBE to save considerable money and time during construction. Established in 1984, TBE grew to a multi-disciplined firm with more than 448 employees in over 32 offices throughout the United States, Canada, United Kingdom, Puerto Rico and China. In September, 2008, TBE Group joined forces with international firm and Australian based Cardno Limited in a merger.

Barnes, Ferland AND Associates, Inc. (BFA): BFA is an environmental engineering and hydrogeological consulting firm, established in 1994 to help meet the growing need for environmental consultants. The firm has a specialty in brownfields worker training, including a special focus on youth training. It is located in Orlando, Florida with satellite offices in West Palm Beach, Florida; Miami, Florida; and New Orleans, Louisiana. BFA is an SBA 8 (a) certified Minority Business Enterprise (MBE) that is dedicated to providing high quality environmental services to clients utilizing state of the art technologies.

Clearwater Global Solutions: This firm brings a public health focus to community environmental and health challenges. It provides supporting services to community based and other organizations.

Sources and Types of Data

Data and other information serves vitally important functions in efforts to improve community health through brownfields redevelopment. First, the data help document the need for projects related to community health through brownfields redevelopment. Second, data can be used to justify project objectives and design. Third, data can provide the baseline status of the population and environment prior to the activity. Fourth, data enable evaluation of the impact of the action. Thus, it is important to develop an understanding of the sources and types of data that are available on relevant issues addressing health and environment. It is also important to understand the gaps that exist in the data. This section addresses data sources that may be useful for project development and for implementation of the public health monitoring provisions of the Brownfields Law. The data sources are first presented according to their informational category, environmental or health. In addition to these categories, data collected at the local level are also described.

Environmental

There are several approaches which can be used to address data and information capacity regarding the environmental conditions within a community. The first is existing data from government and other sources. The second is data search tools which compile information. These are discussed below.

Government Data Sources

Government at all levels (i.e. federal, state and local) serves as a source of data on environmental stressors. Further, within each level of government, there are different agencies with relevant information.

Federal

Much of the data collected by the federal government is also made available through state agencies. The US EPA is the predominant source of data involving contaminated sites, including brownfields. Types and sources of information include the following:

Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS): The Comprehensive Environmental Response, Compensation and Liability Information System contains data on potentially hazardous waste sites that have been reported to the US EPA by states, municipalities, private companies, and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Comprehensive Environmental Response, Compensation, and Liability Information System – No Further Remedial Action Planned (CERCLIS-NFRAP): This database addresses archived sites which are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless further information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Emergency Response Notification System Database (ERNS): The Emergency Response Notification System records and stores information on reported releases of oil and hazardous substances. The source of this database is the US EPA.

Facility Index System Sites (FINDS): The Facility Index System contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statues); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA. The source of this database is the US EPA/NTIS.

Federal Insecticide, Fungicide, and Rodenticide Act (SSTS): This list is produced in response to Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829), which requires all registered pesticide-producing establishments to submit a report to the US EPA by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Hazardous Materials Incident Report Systems (HMIRS): The Hazardous Materials Incident Report System contains hazardous material spill incidents reported to the US Department of Transportation. The source of this database is the US EPA.

RCRA Administration Tracking System Sites (RAATS): The RCRA Administration Action Tracking System contains records based on enforcement actions issued under RCRA and pertaining to major violators. It includes administrative and civil actions brought by the US EPA. The source of this database is the US EPA.

Resource Conservation and Recovery Act – Small Quantity Generators of Hazardous Waste (RCRIS/SQG): This database, entitled RCRAInfo, is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The

database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by RCRA. Small quantity generators (SQGs) produce between 100 kg and 1,000 kg of hazardous waste per month.

Toxic Chemical Inventory System (TRIS): The Toxic Chemical Release Inventory System indentifies facilities that release toxic chemicals to the air, water, and land in reportable quantities under SARA Title III, Section 313. The source of this database is the US EPA.

State

The Florida Department of Environmental Protection (FDEP) serves as a predominant source of information on environmental stressors and on natural resources impacted by pollution. The following databases are relevant to brownfields redevelopment.

Brownfields Redevelopment Program Database: This database provides a list of reports generated from the Brownfields Access Database which tracks the number of designated brownfields areas, executed brownfield site rehabilitation agreements, state and federal programs funding, and local brownfield coordinators' contact information. Sites that are designated within counties by the state of Florida as brownfields are also highlighted.

EPA Brownfields: FDEP maintains information on the US EPA's listing of Brownfields properties addressed by Cooperative Agreement Recipients and Brownfields properties addressed by Targeted Brownfields Assessments.

Currently Registered Commercial Hazardous Waste Transporters : This list provides general information on Hazardous Waste Transporters currently registered with the FDEP which have indicated that they transport hazardous waste commercially.

Currently Registered Used Oil Handlers: This list provides general information on used oil handlers registered through June 30th of each year with the DEP. This list does not account for insurance expiration date being passed, as that is updated only upon re-registration which occurs by June 30th of each year.

Registered Handlers of Mercury Containing Lamps and Devices: This list provides general information on transporters and handlers located in Florida which have registered with the DEP to handle and transport mercury containing lamps and devices destined for recycling.

Dry Cleaning Facilities All Current Owners (by County): This database provides an Excel spreadsheet of the dry cleaning facilities registered with DEP. Information includes facility identification number, site location information, related party (owner) information, and facility type and status. Data are taken from the Storage Tank & Contamination Monitoring database and the registration repository of dry cleaner facility data.

Institutional Controls Registry (ICR) Database: The ICR is a database containing all contaminated sites that are subject to institutional (i.e. restriction on use of or access to a site to eliminate or minimize exposure to contaminants such as deed restrictions, restrictive covenants,

or conservation easements) and engineering controls (i.e. modifications to a site to reduce or eliminate the potential for exposure to contaminants, such as physical or hydraulic control measures, capping, point of use treatments, or slurry walls). The IRC includes site information for the following types of sites:

- sites located in brownfield areas designated by a local government resolution;
- petroleum cleanup program sites;
- drycleaning solvent cleanup program sites;
- Superfund (non-NPL and NPL listed) sites;
- Resource Conservation Recovery Act (RCRA) or Hazardous and Solid Waste Act (HSWA) sites; and
- non-program sites (i.e., state enforcement or voluntary cleanups).

The IRC provides a mechanism for the public and local governments to monitor the status of these controls, monitor the department's short-term and long-term protection of human health and the environment in relation to these sites, and evaluate economic revitalization efforts for brownfield areas.

Storage Tank and Petroleum Contamination/Cleanup Monitoring: This database provides database queries and excel reports created from the State Storage Tank and Petroleum Contamination Monitoring (STCM) database. Information from individual reports can be matched to other reports using the facility identification number. http://www.dep.state.fl.us/waste/quick_topics/database_reports/default.htm

Corrective Action Core Events (CORRACTS): This data source provides a list of handlers with RCRA Corrective Action Activity. This report shows which nationally-defined corrective action core events have occurred for every handler that has had corrective action activity.

Ethylene Dibromide Database (DEDB): This database addresses ethylene dibromide (EDB), a soil fumigant, that has been detected in drinking water wells. The amount found exceeds the maximum contaminant level as started in Chapter 65-550 or 520. It is a potential threat to public health when present in drinking water.

FDEP Dry Cleaners (DRYCLEANERS): This database provides a list of Florida drycleaners.

FDEP Florida Priority Dry Cleaners (PRIORITYCLEANERS): The Florida Priority Cleaners list is developed by the FDEP.

Florida Sites Database (FLSITES): This summary status report is a compilation and revision of other existing lists. It was developed from a number of lists including the Eckhardt list, the Moffit list, the EPA Hazardous Waste Sites list, EPA's Emergency and Remedial Response Information System list (RCRA Section 3012), and existing department lists such as the Obsolete Uncontrolled Hazardous Waste Sites list. The purpose of this list is to track the progress of activities within and outside the department as they relate to the listed sites. It is not a list of controlled sites or sources causing environmental contamination. The Sites List comes from FDEP.

Statewide Oil and Hazardous materials Inland Incidents (FLSPILLS): This data source addresses Fuel Spill Cases from the FDEP's Bureau of Resource Management.

Leaking Underground Storage Tank (LUST): The Leaking Underground Storage Tank Incident reports contain an inventory of documented leaking underground storage tank incidents. The data originates from the DEP's PCTO1 –Petroleum Contamination Detail Report.

Record of Decision Sites (RODS): Record of Decision documents a permanent remedy at an NPL (Superfund) site containing technical and health information to aid the cleanup. These documents are maintained by FDEP and the FDOH.

State Hazardous Waste Record (SHWS): The State Hazardous Waste Sites records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The data originates from the FDEP 's State-Funded Action Sites list.

Underground Storage Tank (UST): The Underground Storage Tank database contains registered USTs. Shortly after the September 11th event, the FDEP was instructed to remove the detail about some of the storage tank facilities in the state from their reports. Federal-owned facilities and bulk storage facilities are included in that set.

Landfills: The Solid Waste Facilities/Landfill Sites records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. The data originates from the DEP's Facility Directory (Solid Waste Facilities)

Listed Water Wells (WELLS): This data base identifies wells in geographic locations and also includes a one mile buffer of those wells.

Search Tools

In addition to sources of data, a number of important search tools have been developed that can assist interested persons in understanding the environmental stressors within a community. These are discussed below.

EPA Geographic Assessment Tool: Developed by the US EPA Office of Environmental Justice, this tool provides important information on sources and location of pollution by geographic areas. It also allows identification of demographic data within geographic locations. As mapping tools, this source can also provide great visuals for presentations related to the project. The tool's capacity to address the location of brownfields sites, which are labeled "local data" is currently limited to those circumstances where the brownfields site has an existing permit.

FDEP Brownfields GeoViewer: This is a mapping tool designed to help interested persons discover and map brownfields in the State of Florida. Using ESRI's ArcIMS software and the Department's ArcSDE database, this tool can locate and display state-designated brownfield

areas and sites with signed rehabilitation agreements. This tool can help determine if those areas fall within or near other State or Federal incentive zones, such as the State's Front Porch Communities, Enterprise Zones, or EPA's Brownfield Pilots. Also, this tool can help identify specific local government, state, and federal point of contacts.
http://www.dep.state.fl.us/waste/categories/brownfields/pages/Geoviewer.htm

Hazardous Waste Handler Search : This search tool provides a database query for RCRA regulated facilities by name, address, county, or EPAID. It includes information about facilities' status and compliance and enforcement histories under RCRA. It also includes a mapping component and a feedback link by which to report data errors.

Health

A significant amount of data is collected at the national level, and often at the state level. A major challenge has been the availability of data at the local level. Fortunately, efforts are underway to expand the scope of this information. Also, there is often federal-state sharing of data. Clusters for accessing data include statistics, tracking, and surveys. The data that may be useful for public health monitoring is discussed below.

Statistics

Vital Statistics: A predominant source of data is statistics derived from the vital registration system. Two major categories of vital statistics are:

- Mortality Statistics: Death certificate data includes demographic information about the decedent and information about the cause of death. Ideally the certificate should include the immediate cause of death together with the contributing factors. The assignment of the cause of death often becomes arbitrary when multiple forms of chronic disease are present, as is often the case for individuals residing within brownfield areas. The full and rigorous use of updated disease coding systems is of utmost importance among this population subset.
- Birth Statistics: These data include much useful information to brownfield communities including conditions present during pregnancy, congenital malformations, obstetric procedures, birth weight, length of gestation and demographic background of the mother. Often these data can be enriched with environmental data to create mapping of clustered defects overlaid with potential environmental exposures within brownfield communities.

US Census Tract Data: This data source offers numerous categories of information that may be relevant to public health monitoring and brownfields redevelopment. These categories include race, income, educational level, access to public water supply systems, and language, among other topics.

Reportable Disease Statistics: Certain human diseases are considered reportable. These diseases vary by state, tend to be ones that pose a danger to the population, and are often infectious or communicable in nature. In some instances, state jurisdictions have made various chronic diseases (e.g. diabetes) a reportable and notifiable disease. This may provide new

capacities for data that may someday better link chronic disease risk to environmental exposures and as such is especially important to brownfields communities.

Physician and Practices Derived Data: The US Centers for Disease Control and Prevention (CDC) supplements its surveillance of infectious disease with a sentinel physician network comprised of 150 family practice physicians located in 121 US cities. Physician records, properly linked through Health Information Technologies are potentially an important source of surveillance data for chronic disease and environmental exposure and thus this source of data may become extremely useful to brownfield communities.

Other Data Sources: In addition to these sources of data, there are numerous other data sets that can provide important information relevant to public health monitoring and brownfields redevelopment. These include: insurance data, hospital and specialty clinics data, absenteeism data, and school health data.

Tracking

Access to Health Care: A tool that has proven very helpful is the US DHHS Health Resources and Services Administration (HRSA) Shortage Designation Advisor. This site provides information on those sites which are within the medically underserved areas or populations (MUA/P) in a geographic location. The lack of access to health care can serve as a surrogate for identifying populations that are vulnerable due to susceptibility (e.g. disease disparities) and disproportionate burden of pollution (e.g. lead poisoning).

Chronic Diseases: The FDOH also tracks chronic diseases. The list of chronic diseases tracked in Florida is found at the following web site: http://www.doh.state.fl.us/Disease_ctrl/epi/Chronic_Disease/Chronic_Disease.htm. The link to CHARTS: http://www.floridacharts.com/charts/chart.aspx includes a list of everything collected through this data source. CHARTS is further discussed in the Locally Collected Data section.

Environmental Public Health Tracking (EPHT): The EPHT network is a collection of state and national web-based data query systems that facilitate the integration, analysis, interpretation, and dissemination of data on environmental hazards, exposures to those hazards, and health effects that may be related to the exposures. For further information see http://www.doh.state.fl.us/environment/programs/Environmental_Public_Health_Tracking/Florida_track_fact_sheet.pdf

Surveys and Surveillance

Morbidity surveys of the general population which may be of use in promoting community health include:

National Health Interview Survey (NHIS): The National Center for Health Statistics (NCHS), which is part of the Centers for Disease Control and Prevention, has conducted the National Health Interview Survey (NHIS) for over 50 years. http://www.cdc.gov/nchs/nhis.htm

National Health and Nutrition Examination Survey (NHANES): For over 40 years, the U.S. Public Health Service has been interviewing and examining tens of thousands of Americans. Teams of doctors, dentists, nutritionists, and health technicians engage communities across the US for the NHANES, which is updated annually. NHANES provides important information that can improve public health through the following focal points:

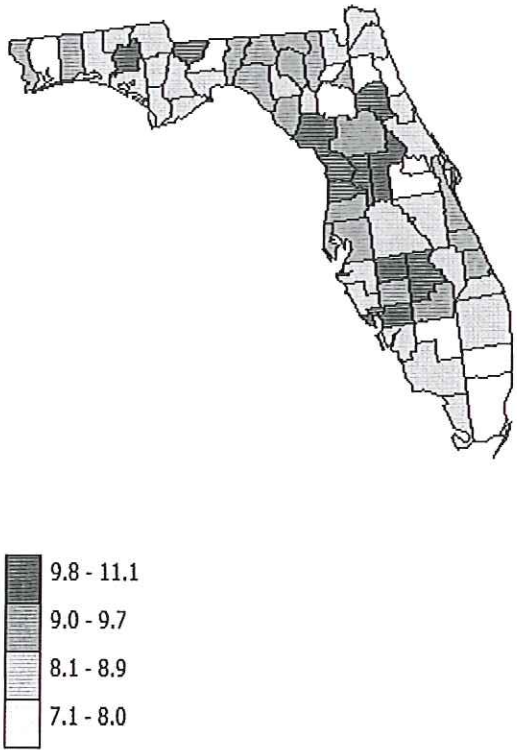
- Osteoporosis. This condition, in which bones get weaker as people grow old, is blamed for many of the fractures among the elderly. NHANES measures the density of participants bones.
- Environmental smoke. The last NHANES found that nearly 9 out of 10 non-smoking Americans were exposed to smoke either at home or on the job.
- Obesity. Despite the public health gains in recent years, more Americans are overweight than ever before. Today, more than half of the adults in the U.S. are overweight, and the number of overweight children and teens has doubled in the past decade. This has led public health experts to look for ways to improve both diet and fitness.
- Changes in Food/Diet. Today consumers can find a wide range of low fat and light foods in their grocery stores, from dinner entrees to snacks. As food habits change, NHANES helps monitor whether these new foods and dietary changes actually are in the best interest of our health.
- Immunizations. NHANES has produced important information about the extent of hepatitis B infections, and led to the recommendation that all infants and children be vaccinated against it. The survey also has alerted doctors to the importance of tetanus shots for older people.http://www.cdc.gov/nchs/about/major/nhanes/whatsnew.htm

National Hospital Discharge Survey (NHDS): The NHDS provides national estimates and selected trend data on the use of non-Federal short-stay hospitals in the US. Estimates are provided by selected patient and hospital characteristics, diagnoses, and surgical and non-surgical procedures performed. Estimates of diagnoses and procedures are presented according to International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) codes. The estimates are based on data collected through the NHDS. The survey has been conducted annually since1965. http://www.cdc.gov/nchs/about/major/hdasd/nhds.htm

Behavioral Risk Factor Surveillance System (BRFSS): BRFSS is a state-based system of health surveys that collects information on health risk behaviors, preventive health practices, and health care access primarily related to chronic disease and injury. For many states, the BRFSS is the only available source of timely, accurate data on health-related behaviors. BRFSS was established in 1984 by the Centers for Disease Control and Prevention (CDC). Currently, data are collected monthly in all 50 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam. More than 350,000 adults are interviewed each year, making the BRFSS the largest telephone health survey in the world. States use BRFSS data to identify emerging health problems, establish and track health objectives, and develop and evaluate public health policies and programs. Many states also use BRFSS data to support health-related legislative efforts. The list of what the BRFSS tracks and years available are at:
http://www.doh.state.fl.us/Disease_ctrl/epi/brfss/BRFSS_Available_Modules.pdf

Recently, BRFSS data is now available on a local level for selected health issues. An illustration of the type of information and data provided by BRFSS is county specific diabetes prevalence data. This data is available at:
http://apps.nccd.cdc.gov/DDT_STRS2/CountyPrevalenceData.aspx

This data shows the following:



2005 Percentage of adults ≥ 20 years old with diabetes

National Survey of Ambulatory Surgery (NSAS): NSAS is the only national study of ambulatory surgical care in hospital-based and freestanding ambulatory surgery centers (ASCs). The NSAS was first conducted from 1994 to 1996, but it was discontinued due to lack of resources. The NSAS was conducted again in 2006.Efforts are now underway to include ambulatory surgery centers in the National Hospital Ambulatory Medical Care Survey (NHAMCS). Hospital-based ASCs will be aded to the scope of the NHAMCS beginning in 2009, and freestanding ASCs will be added in 2010. The NHAMCS website provides more information on the efforts. http://www.cdc.gov/nchs/about/major/ahcd/ahcd1.htm

National Maternal and Infant Health Survey (NMIHS): The objective of the National Maternal and Infant Health Survey is to collect data needed by Federal, State, and private researchers to study factors related to poor pregnancy outcomes, including low birth weight, stillbirth, infant illness, and infant death. The NMIHS was a follow back survey, meaning it followed back to informants named on vital records. The 1988 survey expanded on information available for birth, fetal death, and infant death vital records and was the first national survey that included data on those three pregnancy outcomes simultaneously. A 1991 longitudinal follow-

up to the NMIHS was conducted to obtain additional information about respondents from the 1988 survey. The NMIHS provided data on socioeconomic and demographic characteristics of mothers, prenatal care, pregnancy history, occupational background, health status of mother and infant, and types and sources of medical care received. Data from the study may be used to evaluate factors affecting adverse outcomes of pregnancy. The NMIHS was based on questionnaires administered to nationally representative samples of mothers with live births, stillbirths, and infant deaths during 1988 and to physicians, hospitals, and other medical care providers associated with those outcomes. The survey was based on samples of 10,000 live births, 4,000 fetal deaths, and 6,000 infant deaths. Earlier studies about maternal and infant health were the National Fatality Surveys, conducted in 1963, 1964-66, 1968-69, 1972, and 1980. A National Fetal Mortality Survey was done in 1980, and a National Infant Mortality Survey was conducted in 1964-66. Published findings appear in 'Vital and Health Statistics, Series 22'. http://www.cdc.gov/nchs/about/major/nmihs/abnmihs.htm

National Birth Defects Prevention Network (NBDPN): NBDPN is a group of individuals involved in birth defects surveillance, research, and prevention. It was created to establish and maintain a national network of state and population-based programs for birth defects surveillance and research. The Network assesses the impact of birth defects upon children, families, and health care; identifies factors that can be used to develop primary prevention strategies; and assists families and their providers in secondary disabilities prevention. To fulfill its mission, the Network pursues the following goals: 1) Improve access and application of information about the prevalence and trends of birth defects; 2) Increase collaboration between members within the birth defects community; 3) Advance science through birth defects surveillance and its application to public health efforts and resource allocation The objectives of the NBDPN are to:

- Improve the quality of birth defect surveillance data.
- Promote scientific collaboration for the prevention of birth defects.
- Provide technical assistance for the development of uniform methods of data collection.
- Facilitate the communication and dissemination of information related to birth defects.
- Collect, analyze and disseminate state and population-based birth defect surveillance data.
- Encourage the use of birth defect data for decisions regarding health services planning (secondary disabilities prevention and services).

Other surveys which may be useful are: National Mortality Followback Survey and National Nursing Home Survey. http://www.cdc.gov/nchs/nnhs.htm.

Locally Collected Data

Local agencies also collect data that are relevant to community health and brownfields redevelopment. This data addresses both environmental and health issues. Provided below is information made available through specific county health departments.

Pinellas County Health Department: This local agency provides information related to community health. Data available by zip code includes:

- Number of births by age/race

- Low/very low birth weight
- Infant Deaths
- Total deaths
- Number of STDs by type
- Reportable diseases (i.e. primarily infectious diseases, but some data on heavy metals)
- Lead poisoning
- Cancer deaths/cancer cases
- General demographic data (e.g. race, age, income, etc.) is available from US census bureau, which can be obtained by zip code from the website.

With respect to number of births by age/race, low/very low birth weight, and infant deaths, information can be provided for the clients seen in the county health department health clinic for the various program areas by zip code. Women and Infant Care (WIC) also shows their clients by zip code. An additional possible source of data is 911 call data. While, these are typically emergency issues, this information can be used for violence prevention statistics. If the data request is aggregate for several years, it is possible to get more data by zip code because the number of events would be larger.

The health department also identified critical limitations in the availability of local data smaller than a zip code level. It is only in rare cases that data available for areas smaller than zip code level are available. Further, the health department explained additional constraints. Most of the time requests for health outcomes related to the environment are not defined by a zip code. In general the health department is not allowed to distribute data by geographic area if there are less than three events (e.g. deaths, disease).

Finally, the health department addressed overall data limitations. When the public requests health data outcomes, they typically want data that are not reportable by law. The cancer database is an exception. County level cancer data can be obtained from the website. However, zip code level data may require a request from the State Department of Health.

Hillsborough County Department of Health: This local agency collects and provides important information related to community health. Data sources which may be useful for brownfields project can be accessed according to zip code areas.

Reportable Diseases: All reportable diseases through 2007 are broken down as far as the zip code of residence. There are over 150 reportable diseases that are represented, although many represent diseases that are rare. Lead poisoning is one disease that appears to be significant in this geographic area and may indicate older, poorly maintained housing and contaminated environment. Others that may be of use for brownfields purposes would be diarrheal-type diseases like Giardiasis and Shigellosis that typically are at higher levels with poorer socioeconomic status and lower sanitation levels. One caveat is that to be included in these statistics, a person would have to have visited a doctor and had lab testing done to confirm diagnosis, which is going to occur at a lower frequency in a population with poor access to healthcare. Some more serious diseases like Hepatitis A, B, and C may be more relevant, since they are generally not overlooked as easily as short-term, milder diseases. These diseases often represent risky behaviors and poor hygienic practices, which may be relevant to poorer

socioeconomic status. For further information, see http://www.floridacharts.com/merlin/freqrpt.asp

Environmental Health: This program has data on the incidence of animal bites and sanitary nuisance complaints (e.g. sewage and garbage), down to the zip code level going back many years. It may be possible to tease out data down to zip code level for sanitation scores and specific violations found during inspections of facilities that are regulated (e.g. food, water, swimming pools, group homes, and many others.) This information can be compared with other areas of Hillsborough County to determine whether there are significant differences in types or frequency of problems.

The following data exists, but will have to be requested from the owners of the data. Data use agreements may prevent use of some of the specific data elements. If a need exists for a particular piece of information, it can be requested from the data owners with a justification of the need:

Hospital emergency room visits: This data is available by zip code beginning in 2001, with a few periods of missing data. These are syndrome reports, not specific diagnoses. Many of the visits do include chief complaints, which can be searched for specific words. Data for the past year or so is much more detailed and can be queried for trends, specific words, etc.

Pharmacy Data: Also available is pharmacy data including sales of key over the counter and prescription items. ER and pharmacy data are primarily used for detecting outbreaks and bioterrorism events, but have a great deal of data that may be suitable for categorizing types of health problems in the brownfields study area compared with elsewhere in the community. For example, sales of certain types of medication (e.g. anti-diarrheal drugs, respiratory drugs) may indicate certain types of acute events that may be associated with exposure to chemical or bacteriological agents.

CHARTS: There is a significant amount of other health data available in CHARTS http://www.floridacharts.com/charts/chart.aspx such as mortality rates injuries, chronic diseases, cancer, BRFSS data and many others, but most of this is presented only at the County level. If there is a specific need, it is possible to request much of this data down to a smaller geographical level.

Ultimately, awareness of data sources and the limitations in data sources is crucial for the development of approaches to monitoring the public health impacts of brownfields and brownfields redevelopment. This awareness is equally important in serving as a baseline to measure the impact of interventions taken.

Resources and Sources of Support

In order to implement projects that promote community health through brownfields redevelopment, resources are needed. These resources can be in diverse forms, ranging from funding to technical assistance. This section addresses sources of funding. There are several important sources of funding which can support projects designed to achieve community health and well-being for communities bearing the burden of pollution, disease, poverty and crime. Funding sources can be categorized as government and private foundations. Within each category, there are multiple funding opportunities.

Government Sources

Within federal government, there are numerous opportunities for funding. At the outset, important guidance is found in a recently produced report entitled 'EPA/CDC/ATSDR Federal Grants Guide for Community Environmental and Public Health Activities'. The federal agencies addressed in this guide include the US Department of Agriculture, US Department of Health and Human Services, US Department of Housing and Urban Development, US Department of Interior, and US Environmental Protection Agency. To explore these funding sources, this document, found in the citation below, should be reviewed.
http://www.epa.gov/care/documents/EPA_CDC_ATSDR_Grants_Guide_web_061708.pdf

Based on a review of this document and other sources, the following grant programs may be sources of support for community health and brownfields redevelopment projects. The grant opportunities are discussed according to agency.

US EPA

EPA has programs and projects to protect communities bearing the burden of pollution, disease, poverty and crime from adverse effects on human health and environment. EPA recognizes the importance of providing information and access to EPA's funding sources, training opportunities, and technical and program assistance. EPA is also committed to working in partnership with disproportionately burdened and vulnerable sub-populations to protect public health and the environment, to build the capacity for long-term community-based leadership, and to learn new ways to support environmental justice. Funding sources that may promote community health through brownfields redevelopment that are made available through EPA include the following:

Community Action for a Renewed Environment (CARE) is a competitive grant program that offers communities an innovative way to address the risks from multiple sources of toxic pollution in their environment and to organize and take action to reduce toxic pollution in its local environment. Goals of the CARE Program are:

1) Reduce exposures to toxic pollutants through collaborative action at the local level.
2) Help communities understand all potential sources of exposure to toxic pollutants.
3) Work with communities to set priorities for risk-reduction activities.

4) Create self-sustaining, community-based partnerships that will continue to improve the local environment.

Through CARE, a community creates a partnership that implements solutions to reduce releases of toxic pollutants and minimize people's exposure to them. By providing financial and technical assistance, EPA helps CARE communities get on the path to a renewed environment. Through CARE, various local organizations, including non-profits, businesses, schools and governments create partnerships that implement local solutions to reduce releases of toxic pollutants and minimize people's exposure to them. CARE educates and supports communities by helping them assess the pollution risks they face. Access to EPA and other voluntary programs to address local environmental priorities and improve the environment through local action is also made available. CARE has provided financial assistance by funding cooperative agreements with communities annually since 2005. CARE awarded nearly $3 million in 2008.

Environmental Justice Collaborative Problem Solving Program (EJ CPS): The EPA's Office of Environmental Justice established this program. The purpose of this program is to provide communities with information to help them develop proactive, strategic, and visionary approaches to address environmental justice issues, and to achieve community health and sustainability. The EJ CPS program requires selected applicants, or recipients, to use the Environmental Justice Collaborative Problem-Solving Model (EJ CPS Model) as part of their projects. Grants are available to support the implementation of this model.

Environmental Justice Small Grants Program (EJSG): The EPA's Office of Environmental Justice established EJSG in fiscal year 1994. The purpose of this grant program is to support and empower communities that are working on local solutions to local environmental and/or public health issues. The EJSG Program is designed to assist recipients in building collaborative partnerships that will help them understand and address the environmental and/or public health issues in their communities. Successful collaborative partnerships with other stakeholders involve well-designed strategic plans to build, maintain and sustain the partnerships, and to work towards addressing the local environmental and/or public health issues. The program seeks to provide financial assistance to eligible community organizations and non-profit tribal organizations to work on projects that address environmental justice issues. Awards are for $20,000. Applicable grantees include non-profit organizations, cities, townships or county governments, and tribal governments. www.epa.gov/oecaerth/environmentaljustice/grants/ej-smallgrants.html

Environmental Education: The purpose of this program is to provide financial support for projects that design, demonstrate or disseminate environmental education practices, methods or techniques. Awards are in the range of $4,000-$50,000. Applicable grantees include local, tribal or state education agencies, colleges and universities, non-profit organizations, state environmental agencies, and non-commercial educational broadcasting agencies. www.epa.gov/enviroed/grants.html

Indoor Air Quality Tools for School Program: Asthma Management Training: The purpose of this program is to reduce school occupants' exposure to indoor air pollution and to aid in asthma management. Awards are in the amount of up to $50,000. Applicable grantees include

states, universities, local governments and not-for-profit organizations. www.epa.gov/iaq/schools/

Solid Waste Assistance Grants/Tribal Solid Waste Grants: The purpose of this program is to fund cooperative agreements that promote recycling, solid waste reduction, and energy conservation through source reduction, product stewardship, reuse and composting, market development and job creation, education and outreach, or the procurement of postconsumer recycled content products. Awards are in the range of $30,000-$60,000. Applicable grantees include states, universities, local governments and not-for-profit organizations. www.epa.gov/region04/funding/rcra.html

Source Reduction Assistance: The purpose of this grant program is to support source reduction and/or pollution prevention projects that will provide an overall benefit to the environment by preventing pollutants at the source. Grant awards range from $25,000-$75,000. Applicable grantees include states, local governments, independent school districts, academic institutions, and non-profit organizations. www.epa.gov/oppt/p2home/pubs/grants

Targeted Grants to Reduce Childhood Lead Poisoning: The purpose of this grant program is to conduct activities designed to reduce childhood lead poisoning in vulnerable populations. Grants from $25,000-$100,000 are awarded. Applicable grantees include state, local convents, non-profit organizations, and academic institutions. www.epa.gov/lead/pubs/grantmap.htm

US Department of Agriculture

The US Department of Agriculture offers funding through a variety of programs. While much of the focus may be on rural areas, there are important opportunities that should be considered. The following programs illustrate the type of relevant funding that is available.

Community Facilities Programs: Within these programs, there are two funding opportunities. First, there is the Community Facilities Grants program. These grants can be used to assist poor rural areas and towns in developing essential public community facilities. Funds can be used to supplement funding for all projects eligible under the direct or guaranteed community facility programs. The facility must serve areas where the median household income is below the poverty line or 80% of the state non-metropolitan median household income level. Second, there is the Community Facility Loans program. In this case, loans are made to construct, enlarge, extend or otherwise improve community facilities providing essential services in rural areas and towns with a population of less than 20,000. Funds are available to public entities such as municipalities, counties, special purpose districts, and non-profit corporations.

Community Food Projects (CFP) Competitive Grants Program: This is a major funding source for community-based food and agriculture projects nationwide. The CFP program is administered by the Cooperative State Research Extension and Education Services (CSREES) of the U.S. Department of Agriculture. Community Food Projects should be designed to (1): (A) meet the food needs of low-income people; (B) increase the self-reliance of communities in providing for their own food needs; and (C) promote comprehensive responses to local food, farm, and nutrition issues; and/or (2) meet specific state, local, or neighborhood food and

agriculture needs for (A) infrastructure improvement and development; (B) planning for long-term solutions; or (C) the creation of innovative marketing activities that mutually benefit agricultural producers and low-income consumers.

Funding preference is given to projects that develop linkages between two or more sectors of the food system, support the development of entrepreneurial projects, involve public and for-profit as well as non-profit entities, and promote multi-system, interagency approaches with multi-stakeholder collaborations that build the long-term capacity of communities to address their food and agricultural problems. Funds will also be available for training and technical assistance (T&TA) on a regional and national basis. Only private non-profit organizations are eligible to receive CFP funds directly, but collaborations with public and private, for-profit entities are recommended. Applications are evaluated by reviewers from the food security community. Applicants may request up to $300,000 for projects of up to three years' duration. CFP funds requested must be matched dollar for dollar with non-federal resources. Projects should be planned to use a one-time infusion of federal funds to become self-sustaining. Additional information is available on the USDA Community Food Projects website.
http://www.foodsecurity.org/funding.html

US Health and Human Services

Within HHS there are numerous agencies and offices that have resources which could be applied to community health and brownfields redevelopment. While a comprehensive listing of all grant possibilities is beyond the scope of this document, highlights of opportunities are provided as illustrations according to agency.

Office of Minority Health: The mission of the Office of Minority Health (OMH) is to improve and protect the health of racial and ethnic minority populations through the development of health policies and programs that will eliminate health disparities. OMH and its regional staff also work closely with State offices of minority and multicultural health. The office provides assistance in helping to find government and private funding sources; providing customized funding searches, sharing information about OMH grantees; and, improving grant writing skills. An illustration of the type of funding specifically applicable to minority health is that offered by the FDOH, Office of Minority Health. This Office announced the availability of FY 2009 funds for the Closing the Gap grant program. The Closing the Gap grant program seeks to facilitate the improvement of minority health and elimination of health disparities through the development of community-based and neighborhood-based projects and partnerships with public and private entities and faith-based organizations.

National Institute for Environmental Health Sciences (NIEHS): The mission of NIEHS is to reduce the burden of human illness and disability by understanding how the environment influences the development and progression of human disease. The NIEHS provides federal research funding in the form of grants to universities and other research organizations for research projects, small business awards, research center funding, training and career development, loan repayment programs, and other research projects and activities. The NIEHS employs a variety of grant mechanisms to support a wide array of research projects from single investigator-initiated grants to multi-project, multi-investigator consortia grants. Awards are

made on a competitive basis upon recommendation of a peer review process that scores each application on its scientific and technical merits. An illustration of the nature of funding is a recent funding announcement by NIEHS and National Institute for Occupational Safety and Health (NIOSH) regarding activities to collect information on community exposures to environmental or occupational agents or exposure-related diseases and use this new information to support environmental public health action. This funding opportunity is designed to bring together community members and environmental and occupational health researchers to investigate the potential health risks of environmental and occupational exposures that are of concern to the community. The research to be funded will focus on environmental or occupational agents known or strongly suspected to be a significant environmental public health issue by community members but lacking basic information on exposure levels, sources of exposure, or potential health effects. The activity must also include an education, outreach, prevention or intervention program(s) to translate and disseminate research findings to relevant audiences (e.g. scientists, community members, healthcare professionals, and policymakers) to inform them about the potential health burden(s) associated with environmental or occupational agents in their community. The ultimate goal of the funded activity is to support actions that will lead to the prevention or reduction of harmful environmental/occupational exposures and improve human health. Evaluation will be a central component of all projects. The award provides for up to four years and a budget for direct costs of up to $225,000 per year. http://grants.nih.gov/grants/guide/rfa-files/RFA-ES-09-001.html

Centers for Disease Control and Prevention (CDC): The CDC awards nearly 85 percent of its budget through grants and contracts to help accomplish its mission to promote health and quality of life by preventing and controlling disease, injury, and disability. Contracts procure goods and services used directly by the agency, and grants assist other health-related and research organizations that contribute to CDC's mission through health information dissemination, preparedness, prevention, research, and surveillance. Each year, the CDC awards approximately $7 billion in over 14,000 separate grant and contract actions, including simplified acquisitions. The CDC utilizes grants to assist other health-related and research organizations that contribute to CDC's mission of health promotion through health information dissemination, preparedness, prevention, research, and surveillance. Their website provides useful information on finding and applying for CDC grants. Most awards are made through a competitive application process; however, if either Congress or the CDC determines that a single organization is the best resource for the public service activity, a grant may be awarded without competition.

The competitive process begins with the publication of the Funding Opportunity Announcement (FOA) on both CDC's website and on grants.gov. The FOA describes in full detail the purpose of the award, eligibility requirements, estimated award amount(s), application deadline, and method of selection. Applications that meet the eligibility requirements and are responsive to the FOA are reviewed and scored by an objective review panel based on the criteria published in the FOA. The review panels are comprised of experts knowledgeable in the relevant field. Awards are made according to rank score, additional published criteria, if any, and the availability of funds. http://www.cdc.gov/about/business/funding.htm

The following chart summarizes funding that has been provided by CDC that may be relevant to community health and brownfields redevelopment:

CDC Funded Programs

Name	Description	URL
ACES: Active Community Environments Initiative	Working papers and data analyses to better understand how the natural, built, and social environment influences physical activity.	http://www.cdc.gov/nccdphp/dnpa/aces.htm
Active Environments	Environmental and policy approaches to increase physical activity among all people. This page also links to Active Community Environments (ACES).	http://www.cdc.gov/nccdphp/dnpa/physical/health_professionals/active_environments/index.htm
Designing and Building Healthy Places	Links to a variety of information about the emerging public health issue of the interaction between people and their environments, natural as well as human-made.	http://www.cdc.gov/healthyplaces/default.htm
Environmental Hazards and Health Effects	CDC's National Asthma Control Program supports the goals and objectives of Healthy People 2010 for asthma.	http://www.cdc.gov/asthma/

Private Foundations

Significant sources of resources to implement community health initiatives are private foundations. Generally, private foundations are structured to award grants on a topical basis. Topics applicable to community health through brownfields include environment, health, and community development, among other topics. Historically, one challenge stems from the fact that most foundations operate in a silo fashion: there is very little cross over from one topic to another. Thus, while the community health through brownfields initiative makes a positive impact in several categories, including environment and health, private foundations may view it as a hybrid that does not fit in either category. However, it is nevertheless important to continue to pursue private foundations and work with them to design projects that fit within the foundation structure.

It should also be noted that The Foundation Center's Statistical Information Service identifies the top 50 foundations awarding grants to particular metropolitan areas. Data is available on the top 50 foundations awarding grants in the Tampa, FL Metropolitan Area, circa 2005. The top 10 foundations according to total dollars awarded are: The Kresge Foundation; Publix Supermarket Charities; Eckerd Family Foundation, Inc.; Watkins Christian Foundation, Inc.; The Bank of America Charitable Foundation, Inc.; Triad Foundation, Inc.; Verison Foundation; Walton Family Foundation, Inc.; The Lazarus Foundation, Inc.; and Progressive Energy Foundation, Inc.

Based on a review of foundation interests expressed on their web sites and through selected personal interviews, the following foundations should be considered as potential sources of funding for community health through brownfields redevelopment projects.

Allegany Franciscan Ministries, Inc.: This foundation is a non-profit Catholic organization focused on improving the overall health status of individuals through increasing access to health services and information. In the spirit of the Franciscan Sisters of Allegany and Catholic Health East, the foundation provides resources in a way that creates an atmosphere of healing for those most in need. The foundation strives to partner effectively with other local foundations, grass-roots organizations, and service providers to achieve systemic change and advance the cause of social justice and community health and well-being. Allegany Franciscan Ministries strives to be a catalyst for systemic change, committing resources and working collaboratively to promote physical, mental, spiritual, societal and cultural health and well-being in these communities. Guided by the tradition and vision of the Franciscan Sisters of Allegany, and a member of

Catholic Health East, Allegany Franciscan Ministries provides grants to organizations in three regions of Florida: 1) Miami-Dade County; 2) Palm Beach, Martin and St. Lucie Counties; and, 3) Tampa Bay area of Hillsborough and Pinellas Counties. In the Tampa Bay area, the foundation provides funding through several grant programs, with different guidelines and processes. Major Grants, Tau Grants, and Capacity Building Scholarships are provided to community organizations to help achieve the goal of increasing access to healthcare and improving the overall health status of Tampa Bay region's underserved populations. A Regional Commission, composed of a dedicated and experienced group of community volunteers, meets on a regular basis to assist staff in setting funding priorities, identifying potential investment opportunities, and selecting proposals for funding. Final funding decisions are made by Allegany Franciscan Ministries' Board of Trustees.
Contact: Steve Lesky slesky@afmfl.org

Blue Foundation of Florida: The Blue Foundation for a Healthy Florida, Inc. is the philanthropic affiliate of Blue Cross and Blue Shield of Florida. It is created as a 501(c) (3) philanthropic foundation that supports community-based solutions that enhance access to quality health-related services for the uninsured and underserved in Florida. An important initiative to address the foundation's focus on the causes of childhood obesity is its 'Embrace a Healthy Florida', a statewide initiative that goes beyond the traditional nutrition and fitness programs. 'Embrace a Healthy Florida' will provide grants to non-profit organizations, fund research and foster community collaboration and engagement. The Blue Foundation for a Healthy Florida recognizes the significant interrelationship among research, policy and practice. In the interest of developing a sound strategy to achieve sustainable impact, the foundation is implementing a three-phase approach that builds upon three pillars: 1) Addressing Immediate Community Needs. This phase will include a series of immediate community grants to build stronger practice and policy endeavors to address the causes of childhood obesity at the local and community levels. The process will be informed by national, statewide and local research and initiatives. The purpose of these grants is to build capacity at the local and community level, increase collaborative efforts and attract additional resources. 2) Funding Promising Obesity Research Efforts. This phase will include a series of grants to identify and investigate causes of childhood obesity across the state of Florida. The Blue Foundation will fund research on the causes of childhood obesity. The purpose of this effort is to strengthen the research base to inform policy and practice. 3) Community Engagement. This phase is a long-term approach to addressing childhood obesity throughout Florida. This effort includes a detailed model of community intervention to expand community capacity to address the causes of childhood obesity. Meetings of donors, public sector organizations, and community organizations will be held to identify projects needs, promising programs and practices, lessons learned and perceptions. The Blue Foundation will convene meetings among organizations to engage in a community-wide planning process. The purpose of this effort is to ground research, policy and practice; foster a comprehensive, coordinated community-led approach within each of the five communities; support planning, convening and communication vehicles; and evaluate and identify best practices within this initiative. The Community Engagement programs will be initiated in five communities across Florida: Jacksonville; Miami; Orlando; Tallahassee; and, Tampa.
Contact: Michael Hutton Michael.hutton@bcbsfl.com

Commonwealth Fund: This Fund supports independent research on health and social issues and makes grants to improve health care practice and policy. It is dedicated to helping people become

more informed about their health care and improving care for vulnerable populations such as children, the elderly, low-income families, minorities, and the uninsured. Grant programs address the following: Health Care Disparities; Child Development and Preventive Care ; Quality of Care for Frail Elders ; and, Fellowship in Minority Health Policy. Within the Health Care Disparities category, a program that may be relevant to the community health through brownfields redevelopment is the Medical Homes Address Disparities in Access. Findings from "Closing the Divide How Medical Homes Promote Equity in Health Care" based on findings from The Commonwealth Fund 2006 Health Care Quality, showed that racial and ethnic disparities are not immutable. A survey found that disparities in access to and quality of care largely disappear when adults have a medical home, insurance coverage, and access to high-quality services and systems of care. Systems, in the form of patient reminders, also improve the quality of care for vulnerable patients by promoting higher rates of routine preventive screening. The Program on Health Care Disparities is interested in funding the following types of projects:

1. Assessments of the current level of performance among minority-serving safety-net providers, and factors associated with high performance in terms of quality of case, patient experiences, and efficiency.
2. Evaluations of innovative models and practices that lead to high performance among minority-serving safety-net hospitals and ambulatory care providers.
3. Assessments of the impact of current payment policies, particularly through Medicaid and Medicare, on safety-net provider performance.
4. Evaluations of health reform and its impact on safety-net provider performance.

Contact: Anne Beal, Assistant Vice President, Health Care Disparities, acb@cmwf.org. http://www.commonwealthfund.org/programsgrants/

Robert Wood Johnson Foundation: This foundation provides resources that can assist communities promote and change environments to support physical activity. The following programs may be applicable to community health through brownfields redevelopment:

Active Living by Design: Active Living by Design is a national program of The Robert Wood Johnson Foundation and is a part of the UNC School of Public Health in Chapel Hill, North Carolina. This program establishes and evaluates innovative approaches to increase physical activity through community design, public policies and communications strategies.

Active Living Leadership: Active Living Leadership is a National Initiative supported by the Robert Wood Johnson Foundation (RWJF), developed to support government leaders as they create and promote policies, programs and places that enable active living to improve the health, well-being and vitality of communities.

Active Living Resources: This resource section provides an in depth review of important publications, presentations, tools and other information that support Active Living by Design. Contact: Debra J. Perez, Senior Program Officer, 877.843.7953

Jane's Trust: Grants are made to address important issues in the Trust's fields of interest and areas of geographical focus. The Trustees are interested particularly in organizations and projects

which primarily benefit underserved populations and disadvantaged communities. Grants are made in the states of Florida, with a preference for southwest and central Florida; Massachusetts, with a preference for greater Boston and eastern Massachusetts; and in the northern New England states of Maine, New Hampshire and Vermont. The Trust supports collaborations among non-profit organizations and welcomes collaborative applications. The Trustees understand that grant requests and collaborations may from time to time bridge two or more areas of interest. The foundation supports projects in the area of environment and also of health. Regarding the environment, the Trust aims to protect and enhance the natural environment and to conserve natural resources in its geographical areas of interest. Grants for the environment will be made to support a variety of objectives, including 1) meaningful and innovative contributions to protection of critical or historically significant rural and urban natural resources; and, 2) efforts that have a beneficial impact on the quality of life for underserved populations. Regarding health, the Trust aims to improve the health and welfare of human and animal populations in its geographical areas of interest. Grants for health and welfare will be made to support a variety of objectives, including: 1) efforts to directly improve the health and welfare of vulnerable and underserved populations; 2) projects and organizations that promote individual and community wellness, prevention efforts, and equitable approaches and outcomes; and, 3) interdisciplinary efforts to understand links between human and animal health and welfare. Contact: Susan M. Fish scf@hembar.com; Rachel Pohl rpohl@hembar.com

Home Depot Foundation: The Home Depot Foundation is dedicated to building affordable homes for working families that are healthy to live in and affordable to own. To make homes healthy and affordable, the Foundation encourages developers to incorporate responsible design and use durable materials to ensure that homes are more energy and water efficient, have good indoor air quality, and provide a safe and healthy space to live. Contact: Kelly Caffarelli, President; Cheryl Beardon, Admin Asst. Cheryl_Beardon@homedepot.com

Park Foundation: The Park Foundation primarily supports scholarships in higher education, quality media that heightens public awareness of critical issues, and protection of the environment. The Park Foundation is committed to raising public awareness of freshwater issues. The foundation seeks solutions through funding both established non-profit organizations and modest grassroots initiatives, and prefers to assist organizations networking with others concerned with these issues. The foundation concentrates in the eastern US. The Park Foundation will consider small lead gifts for innovative, new or enhanced programs, challenge gifts to encourage the participation of other donors, "last dollars" to achieve a specific goal, and one-time, short-term gifts to sustain a program until its long-term funding is stabilized. Contact: Jon Jensen jmj@parkfoundation.org ; 607/272-9124

Community Health Care and Brownfields Public Health Monitoring

Populations living in areas with brownfields sites are often low income and populations of color. These populations bear a disproportionate burden of disease, regardless of any causal relationship between exposure to pollution and adverse health impact. They may be affected by serious diseases and other health conditions at far greater rates than would be observed in other populations. Health disparities are the differences in health status between different groups (e.g., race, ethnicity, religion, immigrant status and other factors). Factors such as income, education and where a person lives can make the disparities more intense. Health disparities seen in brownfield communities include diseases such as asthma, cardiovascular disease, diabetes, infant mortality, and birth defects among others. The particular challenges faced by brownfield residents may be exacerbated by or differ from similar communities unencumbered by pollution.

Brownfields areas provide a defined geographic area that can serve as logical sites to gather and analyze health data and health behaviors, incubate interventions and evaluate the impacts of those interventions in a community setting. Brownfields thus represent an overlooked opportunity for applied public health research and a valuable untapped resource for programs and policy that can move the nation toward the elimination of disease disparity. Thus, brownfield communities should be evaluated as a separate population with respect to surveillance, applied public health research and programs and policies seeking to measure, protect and defend health and quality of life. This understanding is necessary in order to develop health systems that are responsive, effective, community-driven and sustainable. Building on this understanding, action is required to address the availability and accessibility of health care. Further action is needed to address the coordination and allocation of health care by community health care providers.

This section describes an opportunity to reduce disease disparities in populations living in areas with brownfields by comprehensively addressing the delivery of health care and using this comprehensive framework to secure public health monitoring data to document the impact of brownfields redevelopment. It commences with a summary of the nature of community health challenges facing populations living in areas with brownfields in Clearwater and East Tampa. Then, provides a description of a public health framework, and finally, it identifies public health interventions achieved through brownfields redevelopment.

Nature of the Challenges

The nature of community health challenges facing the Tampa Bay Region, especially Clearwater and East Tampa , are similar to those faced by other populations that are low income and/or minority. These challenges relate to disease and health impacts, including physical (e.g. diabetes, asthma, cardiovascular disease), mental (eg substance abuse, depression), dental, and vision disorders. Further, the need for preventive care is a major challenge. The capacity of existing health care providers to address these challenges is also limited. Issues of concern include:

- Use of emergency room for clinical and primary care
- Lack of care options after working hours and at night
- Need for outpatient and inpatient wound care services

- Lack of funding and other resources with a special focus on how to best spend limited resources
- Long term operation and sustainability of the health care facility beyond construction costs
- Lack of state approved beds at assisted living facilities (i.e. availability and qualifying for subsidy)

Recurrent challenges related to patient dynamics include access (i.e. distance/buses); language barriers (e.g. Spanish, Laotian) and affordability, especially for ages 18 to 64. Changes in population dynamics are also important. For example, there is a shift in racial and ethnic background in certain communities in Clearwater, from predominantly African American to Hidalgo Mexican. The overarching theme continues to be the accessing of health care in crisis/critical care mode with lack of utilization of preventive measures. For a full discussion of these challenges, see 'Reports from Clearwater Facilitated Dialogue' and 'East Tampa Listening Session'.

Public Health Framework

An important framework to understand and address community health challenges is embedded within basic public health principles. The building blocks for a public health approach include basic definitions and concepts, core competencies, and essential public health services which are discussed below.

Basic Public Health Definitions and Concepts: An initial step towards reducing disease disparities in populations living in areas with brownfields is to develop an understanding of basic public health definitions and concepts. According to the National Institute of Medicine, 'public health' is defined as 'organized community efforts aimed at the prevention of disease and promotion of health'. It should also be noted that 'health' itself is defined broadly. The World Health Organization defines 'health' as a 'state of complete physical, mental and social well-being and not merely the absence of disease or infirmity'. Within the brownfields context, 'health' is defined as the 'complete physical, mental, social and spiritual well-being of the individual, family and community'. Finally, it is important to define 'environmental health'. According to the World Health Organization, 'environmental health' comprises those 'aspects of human health, including quality of life, that are determined by physical, chemical, biological, social, and psychological processes in the environment. It also refers to the theory and practice of assessing, correcting, controlling and preventing those factors in the environment that can potentially affect adversely the health of present and future generations'.

Core Competencies: It is also important to develop an understanding of core competencies for public health professionals. Core Competencies for Public Health Professionals (Core Competencies) were adopted by the Council on Linkages Between Academia and Public Health Practice (the Council) in 2001. They are a consensus set of core competencies for guiding public health workforce development efforts. The core competencies represent a set of skills, knowledge, and attitudes necessary for the broad practice of public health. They transcend the boundaries of the specific disciplines within public health and help to unify the community and the multitude of professions caring for the community. The competencies are divided into the

following eight domains: Analytic Assessment Skills, Basic Public Health Sciences Skills, Cultural Competency Skills, Communication Skills, Community Dimensions of Practice and Skills, Financial Planning and Management Skills, Leadership and Systems Thinking Skills, Policy Development/Program Planning Skills. These competencies relate to the fundamental functions of community health care providers, which include delivery of care, disease prevention, surveillance, health promotion, and policy. Developing skills for each of these functions identified below serves to unify and energize the cadre of professionals who serve populations living in areas with brownfields and help them to change systems that are intended to promote and protect community health.

Delivery of Health Care

- Communicate effectively both in writing and orally.
- Critically review scientific literature relevant to project and public health.
- Interpret findings from epidemiologic studies, including the ability to identify limitations of the data and potential sources of bias.
- Describe how evidence-based approaches and a population health perspective can be utilized to improve individual patient's health.
- Select and use the most appropriate statistical methods to characterize and analyze epidemiologic data.
- Identify community assets and available resources.
- Describe your public health role in the range of health related emergencies, including those that may arise out of natural disasters and acts of terrorism.

Disease Prevention

- Communicate effectively both in writing and orally.
- Demonstrate skill in public health practice by recommending control measures, prevention programs, or other public health interventions based on epidemiologic findings.
- Build a useful knowledge base on how public and private organizations operate within a community.

Surveillance

- Communicate effectively both in writing and orally.
- Identify relevant and appropriate data and information sources.
- Evaluate surveillance systems and define their limitations.
- Understand ethical principles of collection, maintenance use and dissemination of data and information.
- Understand financial aspects to surveillance activities.
- Define components of surveillance systems and identify how they are used to assess health problems in populations.
- Be aware of how data can illuminate ethical, political, scientific, economic and overall public health issues.

- Design a questionnaire or other data collection tool to address a specific health problem.
- Design an epidemiologic study to address a specific health problem.
- Collect and collate health data from appropriate sources.

Health Promotion

- Communicate effectively both in writing and orally.
- Define basic types of epidemiologic study design, uses and limitations.
- Seek an understanding of disease and injury processes and their relationship to a comprehensive definition of health.
- Listen to others in an unbiased manner, respect points of view of others, and promote the expression of diverse opinions and perspectives.
- Create key values and shared vision among your colleagues by conveying public health principles to help guide planned future actions.

Policy

- Communicate effectively both in writing and orally.
- Define the roles of local, state, and federal public health agencies and health care providers and how they might interact and cooperate to solve resolve a population health issue.
- Define the roles that epidemiology and public health play in policy development.
- Identify, interpret and be knowledgeable of how to implement public health laws, regulations and policies related to specific programs.
- Identify the role of cultural, social, and behavioral factors in determining the delivery of public health services.
- Incorporate and defend social, health and environmental justice concepts into your thought process.

Ultimately, building core competencies in public health can assist community health care providers in numerous respects. First, it can help nurture the capacity for cross-cutting initiatives and programs implemented by state and local health agencies. Second, it can help promote ongoing collaboration and communications with partners to enhance delivery, research, training and practice of community health promotion and disease prevention concepts. Third, it can help reduce health disparities through improved targeting of resources and prevention efforts aimed toward people at high risk. Finally, it can help build and maintain a system of health care that offers affordability, continuity and regular sources of care together with advice that empowers the individual and the caregiver.

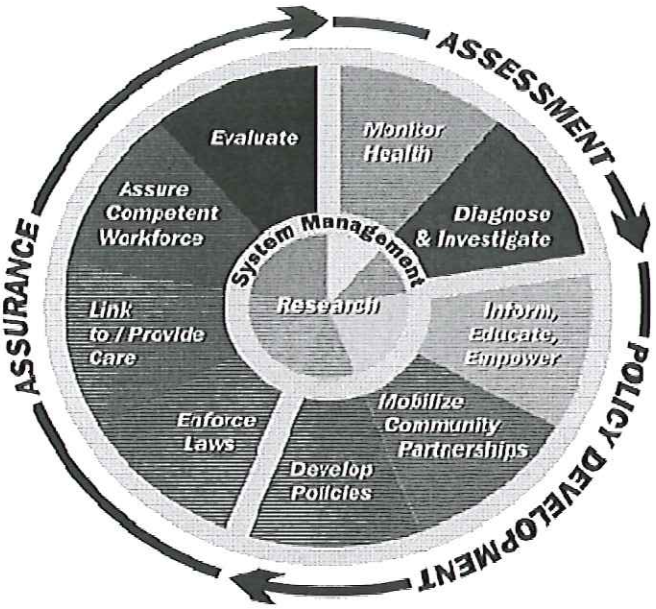
Essential Elements of Public Health: Another important building block of a public health framework addresses essential elements of public health, which were identified by a US Public Health Service (PHS) national workgroup convened in 1993. This group, the Public Health Functions Steering Committee, which was chaired by the Surgeon General and included representatives from most PHS agencies and from a number of national public health

organizations produced 'Public Health in America' in 1994. This consensus document described a vision, a mission statement, a list of public health goals, and a list of ten public health services needed to carry out basic public health responsibilities. The ten services have subsequently been called the 'Ten Essential Public Health Services'. It was the committee's specific intent that these essential services represent the full range of responsibility in public health across federal, state, and local levels. The Essential Public Health Services are inextricably related to core competencies because the competencies help build the skills necessary for providing these essential services. The essential public health services are:

1. **Monitor** health status to identify community health problems.
2. **Diagnose** and **investigate** health problems and health hazards in the community.
3. **Inform, educate, and empower** people about health issues.
4. **Mobilize** community partnerships to identify and solve health problems.
5. **Develop policies** and plans that support individual and community health efforts.
6. **Enforce laws and regulations** that protect health and ensure safety.
7. **Link people to needed personal health services** and ensure the provision of health care when otherwise unavailable.
8. **Ensure** a competent public health and personal health care workforce.
9. **Evaluate effectiveness, accessibility and quality** of personal and population-based health services.
10. Research for **new insights and innovative solutions** to health problems.

The essential public health serves are used as the basis for measuring performance by local and state health departments and are used in studies of national public health expenditures. As such, they provide an important checklist for brownfield community health care providers in assessing challenges in the delivery of health care and achievement of disease prevention and health promotion goals.

The following diagram, entitled 'Public Health Wheel in America', helps delineate the relationship between direct delivery of health care, capacity of the providers to deliver that care, development of policy to sustain that care, and evaluation of programs to ensure quality and continuity of care.



Adopted: Fall 1994, Source: Public Health Functions Steering Committee, Members (July 1995): American Public Health Association, Association of Schools of Public Health, Association of State and Territorial Health Officials, Environmental Council of the States, National Association of County and City Health Officials, National Association of State Alcohol and Drug Abuse Directors, National Association of State Mental Health Program Directors, Public Health Foundation, U.S. Public Health Service --Agency for Health Care Policy and Research, Centers for Disease Control and Prevention, Food and Drug Administration, Health Resources and Services Administration, Indian Health Service, National Institutes of Health, Office of the Assistant Secretary for Health, Substance Abuse and Mental Health Services Administration.

Public Health Interventions Through Brownfields Redevelopment

The application of this public health framework in the context of a brownfields area provides significant opportunities to address community healthcare challenges identified by healthcare providers while simultaneously establishing the capacity to monitor the health impacts of brownfields and brownfields redevelopment. These opportunities include overcoming the silo effect, establishing surveillance, applying the healthiest state model, and applying a chronic disease model. These opportunities are addressed below.

Overcoming the Silo Effect: A framework that contributes to a collaborative approach toward care and prevention is essential for all communities. It is especially important in brownfields areas because of the multiple stressors affecting the population. There are several important measures that can be used to address the silo effect in health care delivery. One essential measure is improved communication. Improved communication supports patient-centered care. This includes, but is not limited to, a focus on the coordination of care across transitions in care settings, building of a common dialogue among diverse stakeholders and the unique potentials for the enhanced use of electronic exchange of health information to improve quality of care. Patient-centered care is essential to residents within brownfields as it is more responsive to the needs and preferences of individual patients, builds patient trust, is culturally sensitive and age-appropriate, provides patients and/or their caregivers with access to their medical information, facilitates communication between patients, caregivers and providers, and empowers patients to

be active participants in care decisions and in the daily management of their health and illnesses. Brownfields as a unique sub-population offers capacity for improved communication that can transform health care decision making. This includes the development, implementation, and integration of health information tools, products or systems through the use of integrated data and management shared among defined provider groups. Additionally, this allows for important development and use of aggregate data for ongoing evaluation of quality improvement, organizational improvement, and population management in health care settings and identification of gaps in service, prevention and rehabilitative support systems.

Additional measures that should be taken to overcome the silo effect include the following:

- Key national partners should be engaged to accommodate the demands of any integrated Brownfield approach toward the adoption of a comprehensive population-based model.
- Providers should collaborate to the fullest extent possible with one another and with state and local health departments to maximize the impact of the Brownfields initiative and help assure sustainability of efforts.
- The building of a shared vision among providers, community based organizations and the general public should be a priority that will ultimately serve to provide better access to and availability of scarce resources.
- Provider behaviors must be modified to avoid complacency and solitude and gravitate toward empowerment for all including supporting necessary expansions and improvements in the health care workforce.

These efforts will ultimately support new insights, innovative solutions and shared definitions of progress for brownfield communities.

Surveillance: Surveillance data are critical for identifying the true burden of disease, formulating recommendations for health care policies and programs and measuring impact of interventions, including brownfields redevelopment. One important surveillance opportunity to improve the health of populations living in areas with brownfields involves collaboration with the Agency for Healthcare Research and Quality (AHRQ). In its 2006 'National Healthcare Disparities Report' (NHDR), AHQR provides a comprehensive national overview of disparities in health care among racial, ethnic, and socioeconomic groups in the general U.S. population and within priority population. The NHDR tracks disparities related to quality of health care and access to health care. It also tracks the progress of activities to reduce disparities. Measures of health care quality address the extent to which providers and hospitals deliver evidence-based care for specific services as well as the outcomes of the care provided. They are organized around four dimensions of quality—effectiveness, patient safety, timeliness, and patient centeredness—and cover four stages of care—staying healthy, getting better, living with illness or disability, and coping with the end of life. Measures of health care access include assessments of how easily patients are able to get needed health care and their actual use of services. They are organized around two dimensions of access—facilitators and barriers to care and health care utilization. Additionally, key themes are highlighted for policymakers, researchers, clinicians, administrators, and community leaders who seek information to improve health care services for all Americans. These themes are:

1) Disparities remain prevalent;
2) Some disparities are diminishing while others are increasing.;
3) Opportunities for reducing disparities remain; and,
4) Information about disparities is improving, but gaps still exist.

To date, brownfield communities have been over looked by the AHRQ's efforts with respect to the NHDR. Their priority populations include women, children, minorities, elderly, rural health, disabilities, low income, and inner city but fail to include brownfields as a population category. The AHRQ's epidemiologic surveillance could be expanded to address special needs within brownfields areas. This may require innovations to standard methodologies aimed at generalizing observations or findings beyond the group studied. Chronic exposure to a variety of toxic elements, reduced access to health care and basic communication technologies combined with high degrees of non-diagnosed disease and lower socioeconomic status all add to difficulties in determining reliable disease estimates among this population subset. Ultimately the utility of this information for use in brownfield communities is related to the quality of the data, its ability to be interchanged and linked between analyses and the timely dissemination and availability of such data to the people who bear the disproportionate burden of disease. This additional perspective would be useful for identifying the unique characteristics of brownfield communities and in helping ensure that all Americans benefit from improvements in care including those residing within brownfields areas.

Healthiest State Model: An important vehicle to promote community health is found in the Healthiest State programs which are emerging across the country. As background, state rankings are contained in 'Health Care State Rankings: Health Care Across America'. For over 16 years, this document has been published by CQ Press, the reference and textbook- publishing division of Congressional Quarterly, Inc.(CQ), a private, independent news-gathering and publishing firm renowned for its objectivity, breadth, depth of coverage, and high standards of journalistic and editorial excellence. Founded in 1945, CQ is owned by the Florida-based Times Publishing Company, a leading independent media organization and publisher of the St. Petersburg Times.

Reports and awards are published annually, which address Health Care State Rankings and the Healthiest State. The Healthiest State designation is awarded based on 21 factors chosen from the Health Care State Rankings, which reflect each state's access to health care providers, emphasis on preventative care, affordability of health care, and the general health of its population. The factors are divided into two groups: those that are "negative" for which a high ranking would be considered bad for a state, and those that are "positive" for which a high ranking would be considered good for a state. Rates for each of the 21 factors are processed through a formula that measures how a state compares to the national average for a given category. The factors are weighted equally. The weighted scores are added together to determine a state's final score. This way, states are assessed based on how they stack up against the national average. The end result is that the farther below the national average a state's health ranking is, the lower (and less healthy) it ranks. The farther above the national average, the higher (and healthier) it ranks. The award is designed to promote a vigorous discussion among citizens and state leaders.
http://os.cqpress.com/Healthiest%20State%202008_Rankings.pdf

Selected states have adopted programs based on the concept of healthiest state. For example, the State of New York has adopted a prevention agenda that identifies ten priorities for improving the health of all New Yorkers and asks communities to work together to address them. These priorities are: Access to Quality Health Care, Chronic Disease, Community Preparedness, Healthy Environment, Healthy Mothers, Healthy Babies, Healthy Children, Infectious Disease, Mental Health and Substance Abuse, Physical Activity and Nutrition, Tobacco Use, and Unintentional Injury. One tool of the Prevention Agenda is the Community Health Planning Approach. This effort seeks to involve a wide range of organizations and community members in developing community health plans that identify and address problems that affect the health of New Yorkers. It calls on local health departments and hospitals to identify two or three of the ten Prevention Agenda priorities and to work with community providers, insurers, community based organizations and others to address community health planning. Statewide program and policy initiatives will complement local efforts. Each local health department will describe community needs and program initiatives in their Community Health Assessments and Municipal Public Health Services Plans for the period 2010-2013. Each hospital will show how they will meet community needs in their Community Service Plan for 2010-12.
http://www.health.state.ny.us/prevention/prevention_agenda/012

In 2008, Florida ranked 46th, in the bottom five, as being the most unhealthy state for the second year in a row. This poor designation provides the stimulus for implementation of new and creative projects, such as promoting community health through brownfields redevelopment. Ultimately, the approach adopted by the State of New York and implemented on a local level could serve as a model for an effort in the Tampa Bay Region, especially for the City of Clearwater and East Tampa. Given the nexus between the Healthiest State program sponsored by the St. Petersburg Times and its proximity to this region, such an effort may find broad support.

Chronic Care Model: Almost half of all Americans live with a chronic condition. More than 125 million Americans suffer from one or more chronic illnesses and 40 million are limited by them. The number of people with chronic diseases is expected to increase by more than one percent per year by 2030, resulting in an estimated chronically ill population of 171 million. Despite annual spending of nearly $1 trillion and significant advances in care, one-half or more of patients still don't receive appropriate care. Gaps in quality care lead to thousands of avoidable deaths each year and millions of avoidable complications. Best practices could avoid an estimated 41 million sick days and more than $11 billion annually in lost productivity. Patients and families increasingly recognize the defects in their care.

Furthermore, almost half of all people with chronic illness have multiple conditions. As a result, many managed care and integrated delivery systems have taken a great interest in correcting the many deficiencies in current management of diseases such as diabetes, heart disease, depression, asthma and others. Those deficiencies include: 1) Rushed practitioners not following established practice guidelines; 2) Lack of care coordination; 3) Lack of active follow-up to ensure the best outcomes; and 4) Patients inadequately trained to manage their illnesses. Overcoming these deficiencies requires transformation of health care from a system that is essentially reactive - responding mainly when a person is sick - to one that is proactive and focused on keeping a person as healthy as possible.

To change outcomes, there must be fundamental changes in the practice of health care delivery, especially within brownfields communities. Reviews of interventions in several conditions show that effective practice changes are similar across conditions. Integrated changes should involve the following components: 1) influencing physician/ non-physician behavior; 2) better use of non-physician team members; 3) enhancements to information systems; 4) planned encounters; 5) modern self-management support; and 6) care management for high risk patients.

To address this challenge, Improving Chronic Illness Care created the Chronic Care Model (CCM). CCM was developed by the MacColl Institute for Healthcare Innovation, refined by a project supported by The Robert Wood Johnson Foundation, and revised based on input from a large panel of national experts. The Model can be applied to a variety of chronic illnesses, health care settings and target populations. Its ultimate goal is healthier patients, more satisfied providers, and cost savings. This model summarizes the basic elements for improving care in health systems at the community, organization, practice and patient levels. The CCM identifies the essential elements of a health care system that encourage high-quality chronic disease care. These elements are the community, the health system, self-management support, delivery system design, decision support and clinical information systems. Evidence-based change concepts under each element, in combination, foster productive interactions between informed patients who take an active part in their care and providers with resources and expertise. Based on more recent evidence, five new themes were incorporated into the CCM: Patient Safety (in Health System); Cultural Competency (in Delivery System Design); Care Coordination (in Health System and Clinical Information Systems); Community Policies (in Community Resources and Policies). http://www.improvingchroniccare.org/index.php?p=Site_Map&s=7
This model could be applied as a follow-up activity in the Tampa Bay Region, especially for the City of Clearwater and East Tampa.

Ultimately, the public health monitoring provisions of the Brownfields Law provide an important catalyst to respond to health challenges of populations living in areas with brownfields while monitoring the health impact of the brownfields and brownfields redevelopment. By understanding core elements and concepts of public health, and their nexus to brownfields redevelopment, the basis for action can be determined.

Jobs, Job Training, and a Green Economy

Brownfields redevelopment offers many opportunities to address multi-dimensional conditions of populations living in areas with brownfields. These conditions related to environmental, health and economic challenges. Low-income people, the working class, and people of color comprise a substantial portion of the population living in areas with brownfields sites. They may have been exposed to contamination of the soil, water and air from the operation of facilities that created the brownfields, and many continue to be exposed. In addition to exposure at their residences, some may have worked at businesses that have become brownfields sites and were exposed through their work. Because some of these businesses are abandoned, they no longer provide employment. Because of the sites' contaminated status, other employers may have been reluctant to provide employment in these areas. These same populations also bear a disproportionate burden of disease, which may or may not be demonstrably-related to their exposure, but certainly impairs their ability to find work. The health burden of this population is exacerbated by the lack of access to health care.

For the past two decades, measures have been taken to respond to this pattern of contamination, economic disenfranchisement and social disruption. Without a doubt, these measures have produced important improvements in the living conditions of these populations. Brownfields redevelopment constitutes a major effort in this regard. A seminal goal of brownfields redevelopment is to ensure economic sustainability and promote economic redevelopment in distressed communities. Workforce development and job training are critical links between environmental cleanup and safe and sustainable community redevelopment. Empowerment of states, municipalities, communities, and other stakeholders in economic redevelopment to work together to prevent, assess, safely clean up, and sustainably reuse brownfields is crucial to success. According to EPA, these efforts help to guarantee that brownfields cleanup and redevelopment have the trained workforce needed to revitalize contaminated properties. They also help ensure that local community members have an opportunity to compete in the economic mainstream. http://www.epa.gov/brownfields/html-doc/wrkfrc2.htm

However, opportunities to improve the sustainability of communities with brownfields remain. These include the need to

- incorporate the knowledge of the residents about site assessment, remediation, and long term stewardship in order to respond to actual cirmumstances of exposure;
- respond to the lack of health care and preventative services for residents which results in disease disparities and often absenteeism from work; and,
- address difficulties in finding sustainable employment in brownfields areas, especially after the remediation has been completed.

It is crucial that programs initiated by EPA and other federal agencies that seek to revitalize blighted communities maximize all opportunities to integrate the economic, environmental, and health elements of brownfields redevelopment. One important vehicle to achieve this purpose is the brownfields workforce development and job training program, which if modestly expanded can respond to growing health and economic challenges. This section addresses opportunities to

promote community health through job related brownfields redevelopment activities and simultaneously strengthen the capacity for public health monitoriong of human health issues associated with brownfields and brownfields redevelopment. In addition to providing general information on job traianing programs, it places special emphasis on the need to integrate the health care sector into this approach.

Background on Brownfields Worker Training

Approach and Authority: A predominant strategy employed by EPA and other federal agencies to promote economic sustainability in brownfields communities throughout the country is to promote workforce development. Efforts are focused on the creation of job opportunities in brownfields neighborhoods. The predominant mechanism to achieve these purposes is funding of job training programs. The statutory language providing the authority for job training is found in CERCLA section 104(k)(6)((A), which provides:

> The Administrator may provide, or fund eligible entities or nonprofit organizations to provide, training, research, and technical assistance to individuals or organizations, as appropriate, to facilitate the inventory of brownfield sites, site assessments, remediation of brownfield sites, community involvement, or site preparation.

EPA has funded several types of programs related to job training. The types of grants which are available to support these job training programs include: 1) assessment demonstration pilot programs to assess brownfields sites and to test cleanup and redevelopment models. Each project can be funded up to $200,000 over two years; 2) job training pilot programs to provide training for residents of communities affected by brownfields to facilitate cleanup of brownfields sites and prepare trainees for future employment in the environmental field. Each project can be funded up to $200,000 over two years; and, 3) cleanup revolving loan fund programs to capitalize loan funds to make loans for the environmental cleanup of brownfields. Each project can be funded up to $500,000 over five years. A major purpose of the pilots are to provide EPA, states, tribes, municipalities, and communities with information and strategies on new methods that promote a unified approach to site assessment, environmental cleanup, and redevelopment. http://www.epa.gov/brownfields/html-doc/wrkfrc2.htm. To implement these funding mechanisms, several important programs have been established. These are described below.

Job Training and Development Demonstration Pilots: In 1998, EPA launched the pilots as a new element of its Brownfields Initiative to help local communities take advantage of jobs created by the assessment and cleanup of brownfields and to facilitate the cleanup of these sites. The job training pilots, each located within or near a Brownfields Assessment Demonstration Pilot, are designed to train residents in communities impacted by brownfields to assess brownfields sites and to test cleanup and redevelopment models. Each project can be funded up to $200,000 over two years. These skills can then be used for future employment in the environmental field, including cleanups employing an alternative or innovative technology. The pilots monitor the progress of trainees for at least one year as they seek employment in the environmental field. Colleges, universities, community job training organizations, nonprofit

training centers, States, counties, municipalities, federally recognized Indian Tribes, and U.S. Territories are all eligible for the job training grants.

Workforce Development and Job Training Partnerships: While EPA maintains a predominant role in brownfields redevelopment, other federal agencies also perform a crucial role. Through the Federal Interagency Partnership, EPA maintains a role in building these partnerships with other federal agencies, and with States and municipalities to meet workforce development and job training objectives. The following federal agencies are also involved in job training.

National Institute of Environmental Health Sciences (NIEHS): As part of the Department of Health and Human Services commitment to the Brownfields National Partnership Agenda, NIEHS provides support for the establishment of the NIEHS/EPA Brownfields Minority Worker Training Program (http://www.niehs.nih.gov/wetp/program/brownfields.htm) which is funded through an interagency agreement with EPA. This program was established to facilitate the development of minority youth worker training programs, tied closely to ongoing activities in Brownfields Pilot cities. This program broadens the Minority Worker Training Program to provide comprehensive training of disadvantaged residents in communities impacted by brownfields in order to foster economic and environmental restoration of their communities. NIEHS awards are made to nonprofit organizations with a demonstrated track record of providing occupational safety and health education.

Department of Labor: EPA and the US Department of Labor (DOL) signed a Memorandum of Understanding (MOU) to establish policies and procedures in support of the Brownfields Initiative. DOL's Employment and Training Administration (ETA) and EPA are supporting the Brownfields Pilots through their respective national and regional office staffs. This EPA/DOL effort focuses on job training and employment opportunities related to the Brownfields Initiative for local youths and adults.

Housing and Urban Development (HUD) (http://www.hud.gov/) provides programs that may be useful to Brownfields Job Development and Training programs. While they occasionally award individual grants, most funds are administered through block grants to states and communities. The final disposition of these funds is the responsibility of state and local governments.

Department of Veterans Affairs: EPA and the Department of Veterans Affairs (VA) are working on an MOU to establish policies and procedures to work together in support of brownfields efforts. It is envisioned that several national programs administered by the VA, such as the Compensated Work Therapy (CWT) programs and the Vocational Rehabilitation and Counseling (VR&C) service, will coordinate with EPA's Brownfields Initiative to provide trained veterans to work in brownfields projects. (http://www.va.gov/)

Hazardous Materials Training and Research Institute (HMTRI): EPA is working with HMTRI, based in the Eastern Iowa Community College District, to expand environmental training and curriculum development at community colleges located near Brownfields Pilots. HMTRI hosts workshops to assist community colleges and other job training organizations from

brownfields communities in developing environmental job training programs. HMTRI also provides follow-up technical assistance to help tailor programs to specific community labor market needs. HMTRI also maintains the "Advanced Technology Environmental Education Center" website. ATEEC provides additional information on educational and job training opportunities, as well as job development activities associated with EPA Brownfields Pilots. http://www.ateec.org/ http://www.hmtri.org/

Ultimately, EPA and its partners are continuing their efforts to develop training and apprenticeship programs to ensure that the short- and long-term economic benefits of brownfields cleanup and redevelopment are shared by local communities.

Integrated Interventions to Link Health and Economic Benefits

The public health approach to brownfields redevelopment is based on the premise that the redevelopment activity represents an intervention designed to alter the outcome from the baseline conditions prior to such redevelopment. For the purpose of addressing the economic elements, the following model interventions have been identified.

Model Legislation: To date, the focus of federal government efforts on job training has been on site inventories, assessments, preparation and remediation and also community involvement, rather than reuse and redevelopment. While considerable progress toward economic redevelopment in brownfields communities has occurred through these training programs, additional efforts are needed to ensure economic sustainability and comprehensive community revitalization.

An important gap that has been identified is the need to expand the scope of job training beyond its current focus to include training for 1) site redevelopment and reuse; and 2) job segments that meet criteria related to brownfields redevelopment, such as responding to unemployed and underemployed in distressed areas and representing job segments with where there is a documented lack of current capacity and potential for economic growth. This expansion could be achieved in part through existing statutory authority. A modest amendment to the statutory language could allow full implementation of this expansion and augment the goal of expanding brownfields job training to ensure sustainable reuse of brownfields and economic vitality for distressed communities.

Despite the fact that the legislative authority could be interpreted to expand the scope of the job training, the relevant statutory language under 104(k)(6)((A) of CERCLA could be amended to reinforce an expanded construct. The following legislative amendment would achieve this purpose:

The Administrator may provide, or fund eligible entities or nonprofit organizations to provide, training, research, and technical assistance to individuals or organizations, as appropriate, to facilitate brownfield work activities such as, inventory development, assessments, remediation, site preparation, redevelopment and reuse, community involvement, and job training for unemployed or the underemployed at redeveloped Brownfield sites in industries such as, but not limited to, environmental, health care, construction, marine and infrastructure.

Further, it would also be useful to add additional language which would strengthen the capacity of the owner/operator of the redeveloped brownfields site to sustain the redevelopment. The following additional language could be added to CERCA section 104(k) (6) ((A) :

> The Administrator may also provide, or fund eligible entities or nonprofit organizations to provide, additional resources including, but not limited to, fixtures and equipment for use on a remediated and redeveloped Brownfield site and personnel necessary to develop and implement a combination of capacity building and training activities that target skills and competencies demanded by local high-growth/high-demand industries. These industries are defined in the context of the region's economy as those which meet one or more of the following criteria: (1) are projected to add substantial numbers of new jobs to the economy; (2) have a significant impact on the economy overall; (3) impact the growth of other industries; (4) are being transformed by technology and innovation requiring new skill sets for workers; or (5) are new and emerging businesses that are expected to grow.

The primary purpose of this additional capacity support is to encourage and facilitate the use of Brownfield sites for jobs creation activities and economic expansion which focus on training skilled workers for local or regional industries and occupations that are (1) expected to experience high growth; (2) where growth is limited because the demand for qualified workers exceeds the supply; or, (3) will add substantially to the regional economy by demonstrating additions to or alignment with the region's economic development activities or growth plan. Preference would be given to applicants who demonstrate integration and alignment into their regional economic development strategy by summarizing the region's strategic vision and workforce education strategies in support of economic growth, Brownfield site re-vitalization and environmental care-taking and by describing how the proposed Brownfield site utilization will integrate, build upon and align with those strategies.

Expansion within Current Brownfields Worker Training Programs: Regardless of whether the Congressional authority regarding brownfields programs is addressed through new legislation, there is support for expanding the nature of brownfields worker training under existing Congressional and US EPA authority. The authority and rational for expansion of EPA's and associated worker training programs beyond its current scope is provided below.

First, EPA's mission supports and integrated approach. The mission of the the US EPA is to protect human health and the environment. EPA's primary strategy to do so is to protect the life-sustaining natural resources of land, air and water. Within the context, EPA has significant programs addressing the built environment, such as healthy homes, schools, and businesses. These efforts address the agency's mission to protect the environment. Given the escalating concern with disease, especially in minority and low income populations, it is essential that measures to protect human health are more fully explored. Accordingly, brownfields worker training can provide an important vehicle to develop strengthened approaches for protecting human health in a manner consistent with EPA's mission.

Second, EPA's Brownfields Economic Redevelopment Initiative supports an integrated approach. According to EPA, its Brownfields Economic Redevelopment Initiative is designed to empower states, communities, and other stakeholders in economic redevelopment to work

together in a timely manner to prevent, assess, safely clean up, and sustainably reuse brownfields. Further, EPA states that it is funding programs include

- Assessment demonstration pilot programs to test redevelopment models;
- Job training pilot programs to provide training for residents of communities affected by brownfields to facilitate cleanup of brownfields sites and prepare trainees for future employment in the environmental field.

EPA further explains that these pilot programs are intended to provide EPA, states, tribes, municipalities, and communities with useful information and strategies as they continue to seek new methods to promote a unified approach to site assessment, environmental cleanup, and redevelopment. EPA further states that it believes that workforce development and job training are the critical links between environmental cleanup and safe and sustainable community redevelopment. These efforts help to guarantee that brownfields cleanup and redevelopment have the trained workforce needed to revitalize contaminated properties, and that local community members have an opportunity to compete in the economic mainstream.
Accordingly, EPA's Brownfields Economic Redevelopment Initiative has already recognized the importance of training for reuse and redevelopment, and for jobs in the brownfields area that would increase employment opportunities for the unemployed and underemployed. This recognition can support an expansion in the scope/ of jobs applicable for worker training programs

Third, EPA risk and remediation decision-making can benefit from an integrated approach. Many of the functions that could be provided through an enhanced brownfields worker training program are needed to better implement brownfields redevelop process with respect to data collection for site remediation decisions and monitoring for long term stewardship.

Current decision-making uses risk-based corrective action, which relies on risk assessment, to determine the type and extent of remedial measures used to address contamination at brownfields sites. Historically, risk assessments have been limited regarding routes of exposure, baseline health status of the exposed population, multiple exposures, and disease data, among other constraints. There is currently an evolving recognition that proper evaluation of contaminated sites should consider the relationship between population vulnerability and exposure to contaminants along with susceptibility of the exposed population.

To a very large extent, resolution of contaminated sites is dependent on the data used in decision-making. Historically, the process has been challenged due to the lack of information on actual circumstances of exposure. There are significant gaps at both the front end and back end of this decision-making. Front end deficiencies stem from assumptions used regarding the extent of contamination and past disposal practices, the health status of the exposed population, and pathways of contamination, and exposure scenarios, including cumulative exposures. Back end deficiencies stem from the lack of data to evaluate the validity of the decision-making and to address performance measures on the health impact of the redevelopment.

A significant source of data that can address both front-end and back-end gaps are community members living in or near contaminated areas. These community members often have knowledge

of historical and current sources of contamination, actual circumstances of exposure, and health status of the exposed population. As members of the community with cultural sensitivity, they may be more effective in gathering data than outside government officials or consultants, although this has not been thoroughly evaluated. The full potential of community residents to provide data on actual circumstances surrounding exposure to contaminated sites has not been utilized in decision-making regarding assessment, cleanup and redevelopment of those sites. While the principle of community participation is well-established in theory and law, implementation has been less effective. Hurdles to efficient participation include lack of awareness of the type and nature of the data that is relevant and confusion about the timing of use of the data by government decision-makers. Further, reliance on voluntary participation by community members fails to account for their limited availability and lack of understanding of the context of decision-making venues.

Fourth, authority exists for expansion of worker training. The Brownfields Law provides the basis for expanding the role of community residents as workers, through the All Appropriate Inquiry rule and provisions related to health monitoring.

The Brownfields Law amends CERCLA by clarifying liability provisions for certain landowners. In particular, Section 101(35) of CERCLA clarifies the requirements necessary to establish the innocent landowner defense and provides Superfund liability limitations for bona fide prospective purchasers and contiguous property owners. Among the requirements added to CERCLA is the requirement that such parties undertake "all appropriate inquiry" (AAI) into prior ownership and use of a property at the time at which a party acquires the property. AAI refers to the requirements for assessing the environmental conditions of a property prior to its acquisition. In the law, Congress specifically directed EPA to address ten criteria:

1) The results of an inquiry by an environmental professional.
2) Interviews with past and present owners, operators, and occupants of the facility for the purpose of gathering information regarding the potential for contamination at the facility.
3) Reviews of historical sources, such as chain of title documents, aerial photographs, building department records, and land use records, to determine previous uses and occupancies of the real property since the property was first developed.
4) Searches for recorded environmental cleanup liens against the facility that are filed under federal, state, or local law.
5) Review of federal, state, and local government records, waste disposal records, underground storage tank records, and hazardous waste handling, generation, treatment, disposal, and spill records, concerning contamination at or near the facility.
6) Visual inspections of the facility and of adjoining properties.
7) Specialized knowledge or experiences on the part of the decedent.
8) The relationship of the purchase price to the value of the property, if the property was not contaminated.
9) Commonly known or reasonably ascertainable information about the property.
10) The degree of obviousness of the presence or likely presence of contamination at

the property, and the ability to detect the contamination by appropriate investigation.

An expanded role for trained community resident is supported by the AAI rule's definition of the 'environmental professional' that oversees the AAI, who is the person that must supervise the preparation of and sign off on the report that constitutes the bulk of the AAI activity. Involvement of community members who are knowledgeable about information required by the AAI rule (e.g. knowledge of past disposal practices), and who can work with the environmental professional, can contribute to the successful completion of the AAI. Thus, the rule provides the basis for expanded community resident worker training.

A second opportunity provided by the Brownfields Law for the expanded role of community resident workers is found in subparagraph (b)(5)(C), the ranking criteria for EPA grants. One criteria is the extent to which a grant would address or facilitate the identification and reduction of threats to human health and the environment, including threats in areas in which there is a greater-than-normal incidence of diseases or conditions (including cancer, asthma, or birth defects) that may be associated with exposure to hazardous substances, pollutants, or contaminants. This section provides authority to address the data gap and other challenges in the risk assessment process. It also increases attention on health matters associated with brownfields by involving community workers in addressing health concerns, including existing health status and impacts of exposure. Finally, this provision is a potential source of financial support to sustain the involvement of community workers in brownfields redevelopment.

Ultimately, current legal authority governing contaminated site remediation and redevelopment buttresses the need for an expansion of minority worker training to increase the skills of community residents so that they can help ensure the proper application of risk based corrective action.

Community Role in Risk Analysis for Site Remediation

As discussed previously, the current focus of federally funded Worker Training Programs on environmental abatement should be expanded to provide the opportunity to integrate community knowledge of data into the risk based corrective action process.

Worker training has the potential to expedite the process of accessing community knowledge of data and concurrently to address the shortage of health care workers in these areas. Community residents are well-suited to collect this data, given proper training. They have historical knowledge and can overcome cultural barriers that thwart data collection by those who do not live in the community or are of different racial and ethnic backgrounds. Similarly, community residents are well-positioned to enhance data collection for the AAI rule and other procedures involved in decision-making on brownfields redevelopment.

Activities that can be undertaken by trained community residents are broad. They can involve participation in the risk assessment process, including assessment of site contamination and health status of the exposed population and assisting in the provision of health care for those who have been putatively exposed. In addition, the expanded focus can include evaluation of the

health impact of redevelopment, including environmental health tracking and performance indicators.

Types of information that community residents can gather include: magnitude, frequency and duration of exposure; comparisons between personal exposure monitoring for indoor, and outdoor measurements; and evaluating the efficacy of a new measurement technique. The challenge is to develop a mechanism in which community members can help gather this information and present it in a format and in a timely matter so that it can be applied in decision-making. The opportunity is to use these needs to develop sustainable jobs for community residents living in areas with contamination. Community resident workers can be trained to collect information on the following technical components of risk based corrective action:

- Past site uses, historical activities, manufacturing and disposal practices
- Spills, dumping, and suspicious activities at or around the site
- Residents and/or workers who are exposed to the site
- Community activities around the site/how people use the land on and near the site
- Pathways by which exposure occurs
- Health status of people exposed to the site
- Sensitive sub-populations and special vulnerabilities of people exposed to the site
- Cultural sensitivities, values and activities that may influence exposure
- Specific sources of data

In addition, trained community resident workers can perform the following relatively low-skill tasks:

- Provide assistance in assembling the cohort of exposed and unexposed populations for epidemiologic studies
- Help collect basic epidemiological information, such as biological samples, environmental samples, and follow-up information on health effects.
- Help identify the cohort of the putatively exposed population
- Contact members of the cohort and see if they wish to participate
- Help to find cohort members who are "lost"
- Question cohort members about socio-demographic and possible exposure to completed pathways
- Collect and process samples, both human and environmental
- Enter data
- Help members of the cohort find health care and work their way through the health care maze
- Translate both ways between health care workers and members of the cohort
- Provide education to the cohort on exposure prevention and appropriate screening
- Help track members to determine health outcomes including mortality
- Help cohort members find jobs
- Provide transportation for cohort members to and from exposure care

With training in the data collection process and other survey techniques, community resident workers can improve the validity of the risk based corrective action process, connect community residents with health care capacity, enhance environmental health research, and participate in economic recovery of blighted areas.

Recommendations for Follow-Up Activities

In light of the aforementioned concepts and models, a number of activities can be undertaken as follow-up activity for the public health monitoring project in the Tampa Bay Region, especially for the City of Clearwater and East Tampa. These activities emerged from the efforts of the project's collaborators and are presented below.

Meaningful Participation

Background: Engagement of a broad array of stakeholders, including those impacted by decision making, in deliberations from the outset is essential. These stakeholders include community based organizations, social service agencies, healthcare advocates and providers, government at all levels, academia, environmental consultants, financial institutions, businesses, and others. Historically, disadvantaged communities are not adequately represented in decision-making. It is important to ensure transparency of information and provide opportunities for meaningful participation by all stakeholders, including disadvantaged populations. To achieve this goal, additional efforts are required to secure their participation.

Methods: To ensure robust participation, the following measures should be considered: creation of listserve specifically for the endeavor selected; distribution of information through existing organizational listserves; participation by stakeholders in on-going organizational activities of collaborators; presentation at organizational meetings; and, announcements of activities through community media outlets.

Capacity Building

Background: Disadvantaged communities often lack the capacity to participate in activities intended to address their challenges. This includes the ability to apply for and administer brownfields and other grants. Further, they are often unaware of government technical assistance programs.

Methods: To facilitate the capacity of community based organizations to participate in brownfields redevelopment, the following measures can be considered: creation of partnerships between disadvantaged community organizations and other entities with capacity, such as academia, businesses, and non governmental organizations; training on legal, technical and health issues associated with brownfields; training on organizational management; technical assistance on both substantive and procedural issues; and grants for administrative as well as brownfields related activities.

Data Sources and Collection

Background: Data is essential for understanding challenges, designing approaches for overcoming those challenges, and measuring the impact of activities in order to evaluate their effectiveness. However, there are numerous challenges regarding data. First, much of the data is not available on a local level. Second, environmental data and health data are not integrated. Third, available information is not accessed.

Methods: To address these challenges, the following measures should be considered: access data that is currently available and clarify the gaps that exist as applied to specific projects; apply community based cumulative risk assessment methods to develop information on multiple stressors; develop and implement sentinel surveillance systems with community members; collaborate with local health and environmental agencies to collect information; engage local health care providers and their associations in efforts to access, develop and strengthen data bases; and, address on and off site data needs for environmental and health endpoints.

Community Health

Activity 1: Conduct a pilot showcase on community health, 'Collaboration in Action'

Background: This project would focus on a specific disease that is a major priority for populations living in brownfields areas, such as diabetes or asthma. Stakeholders would include the local health department, community health care providers, hospitals, community organizations, and other partners. The goal of the collaboration would be to prevent the disease, and improve the team management of its treatment by critically assessing and acting on strengths, threats, and opportunities specific to brownfield communities.

Methods: Leveraging cross cutting opportunities would necessitate building an action framework that overlays disease burden with community resources. A model Collaboration Action Plan would be developed combining front-end consensus together descriptive pre and post analysis that would demonstrate impact and votes for sustainability. The actions should include state and local health departments and should seek cost sharing with specific components of the health department with direct ties to the chronic diseases being considered (e.g. Diabetes Prevention and Control Programs (DPCP's). Cross cutting opportunities in brownfields may necessitate an expansion of the thought processes governing providers behaviors in the areas of service delivery and participation in prevention activities (e.g. pro-bono prevention actions may be tied to provider recognition or a marketing plan that offers a unique Brownfields Health Prevention Award of Excellence). Just as Medicare is offering bonus payments and recognition to physician providers for improved and quantified communication with the extended treatment team, the Brownfields Collaboration Action Plan could promote this favorable reimbursement status to other programs that are state supported (e.g. Medicaid) as well as private insurers. Ultimately the local plan should initiate a statewide dialogue and State Brownfields Collaboration Action Plan.

Activity 2: Seek recognition and coverage of brownfields populations for health analyses through the formation of a Brownfields Epidemiologic Study Group

Background: This effort would seek the formation of a technical study group that would explore among other considerations the expansion of coverage by the Agency for Healthcare Research and Quality (AHRQ) in its 'National Healthcare Disparities Report' (NHDR) to include populations living in a browfields area. Furthermore this technical study group would help ensure that the U.S. Centers for Disease Control and Prevention, and in particular the National Center for Health Statistics, Division of Diabetes Translation, Division of Adult and Community Health, and the Division of Birth Defects and Developmental Disabilities all include a designated

sub-population of brownfield residents in all future surveillance activities and tracking efforts describing chronic disease, illness, birth defects, and disability.

Methods: The Brownfields Epidemiologic Study Group could be sponsored by the University of South Florida, including the Schools of Geography, Public Health, and Medicine. It could seek collaborations with local health departments and community based health advocates and providers.

Activity 3: Conduct pilot model Brownfield Community Health Navigator project

Background: There is an urgent need to develop health systems in brownfields that are responsive, effective, community-driven and sustainable. Additionally, these efforts must address the availability and accessibility of health care in the brownfield settings. This must be accomplished in a manner that builds patient and provider trust and is underscored by patient and professional education and empowerment.

Methods: A trained Brownfield Community Health Navigator would provide a facilitated mechanism to accomplish this goal through improved coordination of care and its proper and essential allocation. Additionally, the trained Brownfield Community Health Navigator could help assure better and more effective use of data. Resources should be utilized to create, model, test, and evaluate a system that brings those who most need health care to appropriate community health care providers in a timely and culturally competent, coordinated, and comprehensive manner through the facilitated efforts of a trained brownfield health navigator. Acceptability, accessibility and outcomes of disease reduction should be described in a manner that would support future modeling of this approach.

Activity 4: Engage National Commission on Vision and Health

Background: The mission of the National Commission on Vision and Health is to improve the nation's visual health by collaborating with experts in science and health policy to ensure informed analysis and policy recommendations in order to prevent blindness, improve vision function, and eliminate vision health disparities. The goal is to assure that the role of optometry and vision care is integrated into public health programs at the national, state and local levels. The Commission provides authoritative information and advice concerning health policy to decision-makers, health professionals, and the public at large. Work of the Commission is shared in consensus reports of expert study committees; symposia and convocations engaging multiple stakeholders in debates of national issues; proceedings from conferences and workshops; and "white papers" on policy issues of special interest.

Methods: The Commission would be engaged in a collaborative effort to advance the mutual goals of the Commission and community based health care efforts. Given the interest of the Commission in increasing access to health care, particularly vision health care, the Tampa Bay Region can provide important information on needs while the Commission can increase access to resources to meet those needs. One activity would be for the Commission to hold its national public meeting in Clearwater, at the Willa Carson Health Resource Center and in East Tampa, at the Tampa Bay Family Health Centers.

Activity 5: Nutrition and Physical Exercise

Background: Populations living in areas with brownfields suffer from high rates of disease which are associated with a variety of factors related to socioeconomic conditions, environmental status, and other issues. Chronic diseases associated with obesity are reaching epidemic proportions. Nutrition and physical activity are related to obesity, both from a negative and positive perspective: poor nutrition and lack of exercise causes obesity and chronic diseases while good nutrition and physical exercise promote good health. Brownfields redevelopment offers the opportunity to change community conditions to promote public health.

Methods: Properly remediated brownfields can serve to encourage urban agriculture and open spaces in communities suffering from obesity. Follow-up projects include: community gardens, farmers markets, gleening activities to collect residential produce and provide it for community purposes, trails, parks and other recreational opportunities.

Other community health tasks include:

*Conduct an Industry Relations and Responsibility Campaign for Improved Community Health: A Giveback Program that Fills Gaps in Prevention and Care. To do this, businesses can conduct in-service training for their employees on chronic diseases that are elevated in the brownfields areas.

*Survey all healthcare providers and cross tabulate their specific expertise in chronic disease with the healthcare needs of the community to more clearly identify gaps and build conduits to care. Relate the type provided per type of provider.

*Develop health-IT systems that improve coordination of care across transitions in care settings, intra-professional communication, enhances dialogue among diverse stakeholders in brownfield communities, and patient communication that builds trust and empowerment of individuals and caregivers. The unique potentials for the enhanced use of electronic exchange of health information in brownfields should be designed to demonstrate improved quality of care.

Job Creation, Job Training, and a Green Economy

Conduct Pilot Health Care Worker and Brownfields Project

Background: The health care sector is a high need, high growth area. In Florida, there is a tremendous shortage of workers in the health care field. The types of workers include but are not limited to medical, e-x-ray and dental technicians. Given the lack of available and accessible health care services for populations living in areas with brownfields sites and the relationship between these workers to proper site assessment, training of health care workers has a nexus to the purpose of the federal brownfields worker training programs.

Methods: A pilot project should be conducted that will utilize the brownfields worker training program to train low-income and minority residents in the health care field. This training will address basic skills to serve in the health care fields. It will also provide additional training on

brownfields redevelopment. Topics to be addressed include risk assessment; cumulative risk impact analysis, engineering and institutional controls; and long term stewardship, among other topics. The pilot can be operated as a collaborative between municipal government (City of Clearwater, East Tampa) job training organizations (eg Ultimate Medical Academy, BFA Environmental), and health care providers (e.g. Willa Carson Community Health Center). Ultimate Medical Academy (UMA) is a nationally-accredited, Florida educational institution that offers careers in the healthcare industry by providing hands-on training and credentials for achieving a career in healthcare as an Allied Health Care professional. Ultimate Medical Academy has a campus in Clearwater (1218 Court Street) and Tampa (9309 N. Florida Avenue). Illustrations of the programs offered include training in therapy, medical assisting, x-ray technician, insurance billing and coding specialist, and nursing assistant careers. The Willa Carson Center is a community health care center established on the state's first designated brownfields area.

Expansion in scope of brownfields worker training programs

Background: The current federal brownfields worker training programs should be expanded in scope to provide training for additional types of brownfields related activities beyond site inventory, assessment, remediation and preparation. Additional training that should be applicable to funding programs should address brownfields reuse and redevelopment, and job training for high need, high growth segments. These segments include health care, construction, marine industries and infrastructure. Selected expansion can be undertaken using existing congressional authorities. The remaining expansion can be achieved through modest legislative amendments to CERCLA. This effort is anchored in Tampa Region stakeholders, and is buttressed by potential collaborators in Connecticut and Massachusetts.

CBO Role in Long Term Stewardship

Background: Populations in areas with brownfields are often low-income or working poor. Youth are also faced with economic challenges. This population could benefit from job training aspects of brownfields redevelopment, especially those efforts that incorporate job creation into the process.

Methods: Community based organizations can sponsor a youth training project on monitoring the implementation of institutional and engineering controls used to prevent exposure to contaminants in brownfields and to ensure long term stewardship of the site.

Conclusion

The City of Clearwater and the City of Tampa with its East Tampa Development Department engaged in innovative and bold measures to promote community health and sustainability through their collaborative PHM Project. Using public health monitoring provisions of the Brownfields Law as a foundation, the Tampa Bay Region PHM Project produced an integrated, community-based framework to measure the public health impacts of brownfields redevelopment. More importantly, the project served as a catalyst to bring together in a collaborative process diverse and essential stakeholders representing community-based organizations, government at all levels, health departments, community health care advocates and providers, businesses, academic institutions, philanthropic organizations, and other leaders. Altogether, the project will continue to have a positive impact on the Tampa Bay Region and serve as a model for communities throughout the country in a unified quest for sustainability.

Appendix B

Annotated Bibliography of Brownfields Publications

Annotated Bibliography of Brownfields Publications

Geoffrey Fouad

07/03/2009

Cardno TBE

USF UNIVERSITY OF SOUTH FLORIDA

Contamination Studies

Anderson, K.D., R. Arora, and J. Benson. 2001. Achieving Brownfields Clean Up at a Radium-Contaminated Site. *Soil and Sediment Contamination: An International Journal* 10 (4): 423 – 437.

The United States Army Corps of Engineer's (USACE) is responsible for remediating sites contaminated by residual radioactive materials. The authors present a case study in which the USACE acted under the Brownfields Initiative to remove radioactive materials from the Cuneo Press Site in Chicago, Illinois. It was suspected that radioactive contamination levels at the site exceeded regulatory minimums. Prior to implementing a removal process, radiological screening and exposure data were used to confirm the radioactive contamination. The USACE then proceeded to remove the radioactive contamination on the brownfield site.

Eiser, J.R., T. Stafford, J. Henneberry, and P. Catney. 2007. Risk perception and trust in the context of urban brownfields. *Environmental Hazards* 7: 150 – 156.

A survey of 747 residents in two urban areas containing brownfields was conducted to assess public perception of contamination risks. The survey gained insight on public perceptions regarding the contamination risks associated with their neighborhood and residence, potential health impacts from contamination, and level of confidence in community development plans and contaminated lands management. The public's level of confidence in community development plans and contaminated lands management was typically low for both surveyed areas. Level of confidence was particularly low for those residents under the impression that they were at risk. Public approval of development plans and contaminated lands management was markedly higher in communities where the local authority implemented a more proactive style of risk communication and openly facilitated discussions. Results from the survey indicate that local authorities gain higher public approval ratings by openly discussing contamination risks.

Gallagher, F.J., I. Pechmann, J.D. Bogden, J. Grabosky, and P. Weis. 2008. Soil metal concentrations and productivity of *Betula populifolia* (gray birch) as measured by field spectrometry and incremental annual growth in an abandoned urban Brownfield in New Jersey. *Environmental Pollution* 156: 699 – 706.

The authors examined a forested brownfield in Jersey City, New Jersey containing elevated levels of heavy metals. Satellite imagery and field spectral measurements were analyzed to determine plant productivity within the brownfield site. Long term tree growth was also monitored using tree cores. Trees exhibited a metal tolerance that decreased significantly in soils with a total metal load (TML) above 3.0. Gray birch, the co-dominant canopy species, shared an inverse relationship with zinc concentration in leaf tissue. A significant relationship existed between gray birch growth and TML. In terms of plant production, TML at an excess of the identified threshold reduced ecosystem function.

Gallagher, F.J., I. Pechmann, J.D. Bogden, J. Grabosky, and P. Weis. 2008. Soil metal concentrations and vegetative assemblage structure in an urban brownfield. *Environmental Pollution* 153: 351 – 361.

Researchers identified the presence of arsenic, chromium, lead, zinc, and vanadium at elevated levels in the soils of a Jersey City, New Jersey brownfield. The study then examined how the dominant plant species from four different vegetative assemblages accumulated the heavy metals. It was determined that the dominant tree species, *Betula populifolia* and *Populus deltoides*, accumulated zinc in leaf tissue at greatly elevated levels. Chromium was found to accumulate at greatly elevated levels in the root tissue of *Betula populifolia*, *Populus deltoides*, and *Rhus copallinum*. By comparing soil metal delineations with vegetative assemblage maps, Gallagher et al. (2008) correlated increased total metal load (TML) to areas vegetated by northern hardwoods. TML decreased in semi-emergent marshes vegetated by endemic species.

Hartley, W., N.M. Dickinson, P. Riby, N.W. Lepp. 2009. Arsenic mobility in brownfield soils amended with green waste compost or biochar and planted with *Miscanthus*. *Environmental Pollution* in press.

The authors argue that contaminated lands represent an opportunity for biofuel production and carbon sequestration in soil containing organic additives. Arsenic mobility was evaluated in three different brownfield soil samples amended with green waste compost (GWC), biochar, or planted with *Miscanthus*. It was determined that GWC increased crop yield and carbon sequestration, which influenced arsenic mobility. Soil amended with biochar increased crop yield and carbon sequestration on a lesser magnitude than GWC. Both amendments were effective at preventing arsenic from leaching into ground water. Planting *Miscanthus* failed to restrict arsenic mobility.

Howland, M. 2004. The Role of Contamination in Central City Industrial Decline. *Economic Development Quarterly* 18 (3): 207 – 219.

Howland (2004) evaluates the extent to which land contamination impedes urban renewal. To do so, the author monitored all real estate sales for a 5,580 acre study area in southwest Baltimore, Maryland. The research discovered that following the mid-1990s contaminated properties sold at reduced prices to compensate for required remediation objectives. The study analyzed real estate transactions for an entire decade in which 144 contaminated parcels were sold. 45 of these contaminated parcels were later sold at market-clearing prices despite a legacy of industrial or commercial contamination. It was determined that contaminated properties not sold within two years or not sold over market-clearing prices were also negatively impacted by a small lot size, oddly shaped lot, inadequate commercial vehicle access, dilapidated infrastructure, and undesirable surrounding land uses.

Jennings, A.A., A.N. Cox, S.J. Hise, and E.J. Petersen. 2002. Heavy Metal Contamination in the Brownfield Soils of Cleveland. *Soil and Sediment Contamination: An International Journal* 11 (5): 719 – 750.

In a study conducted by Jennings et al. (2002), a survey was performed to assess the forms and severity of heavy metal contamination in Cleveland area brownfields. The research revealed that Cleveland area brownfields typically contained contaminated soils that qualified for either residential remediation measures or more intense industrial remediation measures. It was determined that more intense industrial remediation measures were required at a lesser frequency than residential remediation measures. It was also determined that areas surrounding brownfields contained elevated levels of heavy metals, which were frequently above background levels and occasionally qualified for residential remediation measures. Brownfields redevelopment in the Cleveland area should proceed cautiously due to the frequency and severity of heavy metal contamination within these sites. Prior to redeveloping Cleveland area brownfields, the appropriate remediation measures must be accomplished to reduce the potential for public exposure to heavy metal contamination.

Krysinski, D.A., R.G. Ostrowski, E.J. Brosius, and D.H. Cohenour. 2002. Lead Remediation at an Illicit Shooting Range – A Brownfields Success Story. *Soil and Sediment Contamination: An International Journal* 11 (3): 422 – 423.

Krysinski et al. (2002) discussed a case study in which unauthorized target shooting contaminated topsoil with excess lead concentrations. Sampled soil contained lead concentrations beyond the RCRA standard, while less contaminated samples contained sufficient lead concentrations to be categorized as non-hazardous industrial waste. To remediate the lead contamination, the Toxicity Characteristic Leaching Procedure (TCLP) and a total lead cleanup standard was implemented by the Oklahoma Department of Environmental Quality (ODEQ) with funding received from the state's Voluntary Cleanup Program (VCP). Tested soil samples that contained excess TCLP lead concentrations were excavated and treated on-site using a coal fly ash formula. The treatment procedure was deemed successful at immobilizing the lead and returning concentrations to less than standard limits. The coal fly ash remediation technique returned lead concentrations to acceptable levels and expedited the property's redevelopment plans.

Simons, R.A., J. Pendergrass, and K. Winson-Geideman. 2003. Quantifying Long-term Environmental Regulatory Risk for Brownfields: Are Reopeners Really an Issue? *Journal of Environmental Planning and Management* 46 (2): 257 – 269.

The authors examined voluntary clean-up programs (VCPs) frequently completed prior to a brownfield's redevelopment for the purpose of removing contaminants from the site. VCPs that are determined to be successful in removing the health risk of a contaminant provide closure letters to the developers assuring that the remediation process was effective. Despite efforts by VCPs, financial lenders are still hesitant to fund projects that have been granted closure letters for fear of lingering contaminants. The research for this paper assessed the frequency of VCPs that fail to remediate contaminants and the remediation process must be 'reopened'. The investigation revealed that VCP remediation sites were only 'reopened' at a rate of between

0.1% and 0.2%. This minor frequency rate may increase through time and from more stringent environmental regulator patterns. The authors conclude that brownfield redevelopers should not be concerned with the potential for 'reopened' remediation after the successful closure of a VCP.

Verstraete, S. and M. Van Meirvenne. 2008. A multi-stage sampling strategy for the delineation of soil pollution in a contaminated brownfield. *Environmental Pollution* 154: 184 – 191.

Soil pollution was delineated using a multi-stage sampling strategy based on sequential Gaussian simulation. This delineation technique was applied in Belgium to a 5.2 hectare brownfield contaminated with lead. Initially, 240 samples were collected from the brownfield with an additional 25 samples per stage. Uncertainty in the lead delineation was reduced during each successive sampling stage. An optimum sampling stage was selected by observing the median conditional coefficient of variation. For this particular brownfield, 365 samples were sufficient for accurately delineating the lead contamination. This number of samples represented a 70.7% increase in the sampling amount typically used to delineate contaminations on properties of similar size.

Mapping, Distribution, and Identification Studies

Bjelland, M.D. 2004. Reclaiming Brownfield Sites: From Toxic Legacies to Sustainable Communities. In *World Minds: Geographical Perspectives on 100 Problems*. ed. Janelle, D.G. et al., 197 – 202. The Netherlands: Kluwer Academic Publishers.

Bjelland (2004) describes brownfields as one of the most critical issues concerning communities of developed nations. If brownfield redevelopment is unsuccessful, these sites will threaten public health and impede economic growth. Communities unsuccessful at redeveloping brownfields are inclined to develop environmentally pristine sites located at the metropolitan fringe. Bjelland (2004) proposes that geographic research methods should assume a central role in both identifying potentially contaminated sites as well as rehabilitating these sites. Policy-makers should consult geographers to gain an understanding of the causes, degree, spatial distribution, and impact of brownfield sites either perceived as contaminated or actually contaminated.

Chen, Y., K.W. Hipel, D.M. Kilgour, and Y. Zhu. 2009. A strategic classification support system for brownfield redevelopment. *Environmental Modeling and Software* 24: 647 – 654.

The authors present a decision support system to classify and prioritize brownfield redevelopment projects. This system broadly classifies cities with brownfields according to redevelopment effectiveness and future needs. Classifying specific brownfield sites is accomplished by assessing data acquired from a survey of cities in the United States. The classification system proves to be effective because it reduced the need for preference information, addressed information gaps, and provided easily interpreted language for redevelopment decisions. The classification system will assist government decisions regarding brownfield redevelopment projects, prioritization, and budget planning.

Coffin, S.L. 2003. Closing the Brownfield Information Gap: Some Practical Methods for Identifying Brownfields. *Environmental Practice* 5: 34 – 39.

Coffin (2003) discusses research methods for identifying contaminated brownfields despite property owner objections. Oftentimes, communities encounter challenges when assessing the distribution of brownfields due in part to property owner reluctance to divulge potentially harmful information. The author insists that brownfield identification can be accomplished through a review process of publicly accessible government records. Due to the public accessibility of these records, property owner objections can be avoided and contaminations can be identified without having an intimate knowledge of the property.

Greenberg, M., K. Lowrie, L. Solitare, and L. Duncan. 2000. Brownfields, Toads, and the Struggle for Neighborhood Redevelopment: A Case Study of the State of New Jersey. *Urban Affairs Review* 35 (5): 717 – 733.

A survey of all New Jersey cities was conducted by Greenberg et al. (2000) to evaluate the frequency of brownfields that directly reduced surrounding property values and influenced surrounding land uses. Four of every five cities replied to the survey with 10% of the respondents confirming that brownfields influenced surrounding property values and uses. 3% of the respondents corroborated negative community impacts more than a quarter mile away from the actual brownfield site. Communities experiencing negative impacts more than a quarter mile away from the actual brownfield were also typically characterized by unsafe conditions and insufficient public services. Greenberg et al. (2000) concludes by discussing policy recommendations for those communities most negatively impacted by brownfields.

Lafortezza, R., G. Sanesi, B. Pace, R.C. Corry, and R.D. Brown. 2004. Planning for the rehabilitation of brownfield sites: a landscape ecological perspective. In *Brownfield Sites II*. ed. Donati, A. et al., 21 – 30. Billerica, Massachusetts: WIT Press.

Lafortezza et al. (2004) applied an algorithm within a Geographic Information System (GIS) for the purpose of identifying brownfields that could be redeveloped into wildlife habitat adjacent to other naturally preserved lands. This model was specifically applied to urban planning scenarios for a sizeable brownfield situated at the fringe of Bari, Italy. Planning scenarios simulated by the model were distinguished by various redevelopment tactics such as site remediation, introducing isolated patches of vegetation, and more extensive planting efforts. Results from the model were statistically analyzed to determine the most beneficial redevelopment tactics for each urban planning scenario. The study concluded that this form of landscape ecology modeling supported by a GIS environment could be a useful tool for decision makers attempting large-scale brownfield redevelopment.

Leigh, N.G. and S.L. Coffin. 2000. How Many Brownfields Are There? Building an Industrial Legacy Database. *Journal of Urban Technology* 7 (3): 1 – 18.

Leigh and Coffin (2000) discusses brownfield databases at the city-wide level. The authors provide suggestions for those cities attempting to construct a database for brownfield inventorying and classifying. Geographic Information Systems (GIS) are recommended to

monitor the spatial distribution of brownfields as well as store data describing the abandoned property. Prior to designing a brownfields database, the article suggests that cities gain a valid perspective on the scope of their brownfield problem. Brownfield databases are not only recommended for large metropolitan areas but also cities that contain high concentrations of abandoned industrial and commercial land uses.

Page, G.W. and R.S. Berger. 2006. Characteristics and land use of contaminated brownfield properties in voluntary cleanup agreement programs. *Land Use Policy* 23 (4): 551 – 559.

Empirical research was conducted to identify the common characteristics and land uses of contaminated brownfields involved in voluntary cleanup agreements. 1415 contaminated brownfields within the states of New York and Texas were sampled to determine the common characteristics and land uses of properties participating in voluntary cleanup agreements. Results from this research uncovered a wide array of land uses responsible for site contamination. Results also contributed knowledge useful for constructing policy effective at promoting brownfield redevelopment. Land use data at the time of contamination and remediation were analyzed to establish the common characteristics of properties participating in voluntary cleanup agreements.

Thomas, M.R. 2002. A GIS-based decision support system for brownfield redevelopment. *Landscape and Urban Planning* 58: 7 – 23.

Brownfield redevelopment is rapidly being utilized by urban planners due to the negative impacts of suburban sprawl. To assess the feasibility of brownfield redevelopment, urban planners require data that describes land redevelopment possibilities, redevelopment incentives for site-specific locales, public opinion, and contamination concerns. Thomas (2002) discusses a Geographic Information System (GIS) that would assist urban brownfield redevelopment plans. This decision support system applies a modeling tool known as Smart Places, which is capable of identifying brownfields and exploring potential redevelopment possibilities. The GIS-based modeling tool was specifically applied to an urban setting in the state of Michigan. The researchers conclude that the Smart Places brownfield redevelopment modeling method would be readily applicable to other metropolitan areas.

Thomas, M.R. 2003. Brownfield Redevelopment: Information Issues and the Affected Public. *Environmental Practice* 5 (1): 62 – 68.

Thomas (2003) argues that brownfield redevelopment requires the dissemination of more information than traditional real estate development. Besides information pertaining to brownfield identification and remediation, the public should be provided information explaining how a property will be remediated and transformed into a productive land use. Developers should also distribute this type of information to local government officials responsible for property revitalization projects. Increasing concerns regarding environmental justice, social equity, and quality of life associated with brownfield redevelopment will also require the collection and distribution of additional information. Improving the quality and availability of information will subsequently enhance future brownfield redevelopment plans including site suitability determination, project prioritization methods, and training programs. The article

specifically discusses information sources used to support brownfield redevelopment decisions in the state of Michigan. The author concludes that such decision support systems can be adapted and applied to other communities with brownfield redevelopment aspirations.

Yount, K.R. 2003. What Are Brownfields? Finding a Conceptual Definition. *Environmental Practice* 5 (1): 25 – 33.

The author proposes that two types of brownfield definitions become standard. The first definition is a broad statement that will facilitate the creation of brownfield inventories for the purpose of resource management, the distribution of federal funding, and informing communities of relevant public health concerns. This definition will allow policy makers to address brownfields as negative influences on both the environmental and economic status of a community. The second definition will be used to categorize brownfields according to their qualifications for particular redevelopment programs. Yount (2003) analyzes the components of numerous brownfield definitions prominently used in current literature and policies. He determines that the most effective broad definition for brownfields is provided in the 2001 Brownfields Revitalization and Environmental Restoration Act. Subsequent and more refined definitions should categorize brownfields according to their eligibility for redevelopment programs.

Brownfield Redevelopment and Policy Analysis

Adams, D. 2004. The changing regulatory environment for speculative housebuilding and the construction of core competencies for brownfield development. *Environment and Planning A* 36: 601 – 624.

In the United Kingdom, residential construction regulations have become more stringent due to sustainable development initiatives. One of these regulations requires that 60% of all new residential construction projects must be located on previously developed land or through existing building renovations. 80% of residential construction projects in the United Kingdom are completed by private entities. Therefore, successful implementation of more stringent residential construction regulations will be greatly dependent upon private sector involvement. Adams (2004) investigates the primary influential factors of the residential construction market. In doing so, the author attempts to determine necessary changes to private residential construction practices for successful enforcement of more stringent governmental regulations. Findings from this research indicate that private home builders focused on brownfield redevelopment will become residential construction market leaders.

Adams, D., A. Disberry, N. Hutchison, and T. Munjoma. 2000. Mind the gap! Taxes, subsidies and the behavior of brownfield owners. *Land Use Policy* 17: 135 – 145.

Adams et al. (2000) examines the effectiveness of fiscal incentives to stimulate brownfield redevelopment projects. Results from a three-year study focused on land ownership restrictions were used to determine whether tax incentives or subsidies are more effective at promoting brownfield redevelopment. The study evaluated 20 different development projects in four major United Kingdom cities. During the study, 140 landowners were interviewed to determine which

incentive strategies were most effective at motivating redevelopment. The interviews revealed that grants and subsidies were most effective at motivating landowners to redevelop brownfields. The researchers conclude that both tax incentives and subsidies are capable of promoting brownfield redevelopment. When selecting the appropriate fiscal incentive, policy-makers should consider local conditions and historical trends.

Adams, D., A. Disberry, N. Hutchison, and T. Munjoma. 2001. Ownership constraints to brownfield redevelopment. *Environment and Planning A* 33: 453 – 477.

Adams et al. (2001) examined land ownership restrictions encountered during brownfield redevelopment. Ownership restrictions are a result of fluctuations in the land market, the distinct traits of a landowner, and institutional land ownership. To proceed with this study, the researchers were obligated to introduce a formal definition of land ownership restrictions. From there, they were able to classify the various types of land ownership restrictions. After classifying the various types of land ownership restrictions, the study proceeded to explore how each type of land ownership restriction impacted eighty brownfield redevelopment projects in four British cities from 1991 to 1995.

Alberini, A. and D. Guignet. 2009. *Voluntary Cleanups and Redevelopment Potential: Lessons from Baltimore, Maryland.* Berkeley, California: The Berkeley Electronic Press.

Brownfield remediation and redevelopment are frequently supported by policies that offer economic incentives and liability attenuation. The effectiveness of these policies has yet to be fully explored. State Voluntary Cleanup Programs, or VCPs, promote brownfield remediation and redevelopment through economic incentives and liability attenuation. To evaluate the effectiveness of such a policy, the authors examined Baltimore properties redeveloped using the Maryland VCP. The purpose of this study was to determine the type of properties that typically participate in these programs, compare participating properties to non-participating redevelopment projects, and identify how frequently VCP properties are fully redeveloped into their proposed land use. Approximately two-thirds of the Baltimore properties participating in the Maryland VCP preferred to forego any further remediation tasks. Industrial properties isolated from residential land uses typically applied for the Maryland VCP. After remediation, these sites were commonly redeveloped for industrial or commercial purposes. By redeveloping contaminated sites, VCPs in the Baltimore area alone prevented the development of naturally preserved land by 1,238 to 6,444 acres according to the study.

Alberini, A., A. Longo, S. Tonin, F. Trombetta, and M. Turvani. 2005. The role of liability, regulation and economic incentives in brownfield remediation and redevelopment: evidence from surveys of developers. *Regional Science and Urban Economics* 35: 327 – 351.

The authors investigated brownfield redevelopment policy featuring economic incentives such as relaxed environmental regulations, reduced liability concerns for future remediation tasks, and government subsidies. The research for this paper surveyed private real estate developers with questions regarding these economic incentives. Responses to the questions revealed that real estate developers perceive brownfields, specifically brownfields with real contamination issues,

as less appealing for redevelopment. When redeveloping a site known to be contaminated, real estate developers were highly in favor of policies promoting reduced liability. It was also discovered that government subsidies motivate developers with prior experience in redeveloping a contaminated property. Real estate developers with little to no experience in redeveloping a contaminated property preferred reduced liability and relaxed environmental regulations. The researchers conclude that brownfield redevelopment policies containing economic incentives are capable of altering urban land uses.

Apostolidis, N. and N. Hutton. 2006. Integrated Water Management in brownfield sites – more opportunities than you think. *Desalination* 188: 169 – 175.

Apostolidis and Hutton (2006) explore the potential for integrated water management (IWM) techniques on brownfield sites. The successes of recent projects in Australia indicate that IWM techniques can be implemented on brownfields. In some instances, brownfield redevelopment projects that implemented IWM were more cost effective than redevelopment plans that incorporated traditional water management systems. IWM has been successfully applied to residential, commercial, and industrial redevelopment projects. The paper presents case studies to describe IWM techniques and their impact on the public and local authorities.

Bacot, H. and C. O'Dell. 2006. Establishing Indicators to Evaluate Brownfield Redevelopment. *Economic Development Quarterly* 20 (2): 142 – 161.

Criteria for evaluating the effectiveness of brownfield redevelopment programs are identified within this paper. The researchers determined that property value, private and public investment, and grant funding are all common components of brownfield redevelopment programs. Then, the researchers assessed these components for a local brownfield redevelopment program in Charlotte, North Carolina. During this assessment, researchers were able to identify common criteria for measuring the effectiveness of a brownfield redevelopment program. Standardizing the process of measuring redevelopment program effectiveness can be accomplished by establishing federal uniformity. Also, states must require data collection for the purpose of measuring program effectiveness. The researchers suggest that the Environmental Protection Agency (EPA) should be responsible for establishing standardized criteria for measuring redevelopment program viability.

Bartsch, C. and B. Dorfman. 2000. *Brownfields and Housing: How are State VCPs Encouraging Residential Development?* Washington, D.C.: Northeast-Midwest Institute.

The report by Bartsch and Dorfman (2000) summarizes the findings of a brownfields survey administered by the Northeast-Midwest Institute. Residential developers have become increasingly more willing to construct homes on formerly contaminated properties known as brownfields. Despite the risks associated with environmental contaminants, brownfields are appealing sites for residential redevelopment due to their ideal locations typically within rapidly developing urban areas. Also, the necessary infrastructure and municipal services typically already exist at these sites. Results from the survey indicate that brownfields have become increasingly desirable locations for residential redevelopment due to their urban surroundings.

The survey also revealed that voluntary cleanup programs (VCPs) have enhanced the possibility of residential redevelopment on brownfield sites.

Bartsch, C. and B. Dorfman. 2000. *Guide to Federal Brownfield Programs*. Washington, D.C.: Northeast-Midwest Institute.

This text provides a thorough review of brownfield redevelopment initiatives formally adopted by the Environmental Protection Agency (EPA). Additionally, it details the brownfield redevelopment resources offered by government agencies other than the EPA. Information for this report was gathered by interviewing spokespersons representing each agency involved in the Brownfields National Partnership. These interviews were an attempt to identify government programs most suitable for brownfield redevelopment needs such as financial compensation and technical assistance. The report also provides critical reviews on how to make pre-existing programs compatible with brownfield redevelopment needs.

Braswell, B.J. 1999. Brownfields and Bikeways: Making a Clean Start. *Public Roads* 62 (5): 32 – 39.

Braswell (1999) explores the possibility for redeveloping brownfields into an alternative transportation network such as a greenway. Recent alterations to Federal Highway Administration (FHWA) policy permit the transformation of potentially contaminated sites into infrastructure for alternative transportation networks. Braswell (1999) specifically discusses the Woonasquatucket River Greenway Project, an urban revitalization project focused on an interconnected corridor of brownfields located in Providence, Rhode Island. The concentration of brownfields positioned adjacent to the Woonasquatucket River were selected as one of the 16 Brownfields Showcase Communities by a partnership of 15 federal agencies known as the Brownfields National Partnership. The Woonasquatucket River Greenway Project received federal funding through the Transportation Improvement Program (TIP) and transformed former brownfields into a 7 kilometer bicycle and pedestrian path into downtown Providence. Success of the Woonasquatucket River Greenway Project depended on community commitment, collaborative funding through agency partnerships, legal support, and a successful design encouraging community use.

DePass, M. 2006. Brownfields as a Tool for the Rejuvenation of Land and Community. *Local Environment* 11 (5): 601 – 606.

DePass (2006) recognizes brownfields redevelopment as an essential component of community sustainability and economic development. In the paper, the author supports this perception by citing examples of brownfield redevelopment projects propelled by Community Benefit Agreements (CBAs). CBAs facilitate dialogue between active community members and developers and create a platform for environmental initiatives focused on sustainable development. The use of Community-Based Participatory Research (CBPR) frameworks is also proposed as another viable method for successfully implementing brownfield redevelopment projects. A CBPR is a research partnership between scientists and the public dedicated to improving the conditions within a community.

De Sousa, C.A. 2002. Brownfield redevelopment in Toronto: an examination of past trends and future prospects. *Land Use Policy* 19: 297 – 309.

In a study conducted by De Sousa (2002), the development patterns in Toronto during the 1990s are described and primary factors influencing these patterns are identified. While development of natural areas surrounding the metropolis remained the predominant trend, an increasing tendency to redevelop brownfields situated within the urban interior was also recognized. Data relevant to this research project was gathered from a City of Toronto land use database, stakeholder interviews, and case studies. Cities characterized by similar socioeconomic conditions should refer to Toronto as a model for promoting both private and public brownfield redevelopment projects. Brownfield redevelopment results encountered in Toronto should be considered by cities of similar socioeconomic standing.

De Sousa, C. 2000. Brownfield Redevelopment versus Greenfield Development: A Private Sector Perspective on the Costs and Risks Associated with Brownfield Redevelopment in the Greater Toronto Area. *Journal of Environmental Planning and Management* 43 (6): 831 – 853.

This paper compares the economic costs and risks associated with brownfield redevelopment and greenfield, naturally preserved areas, development in the Greater Toronto Area. The economic costs and risks associated with both activities are assessed from a private sector perspective. Policies intended to diminish the economic costs and risks related to both brownfield redevelopment and greenfield development are evaluated by the author. With the use of interviews, case studies, and hypothetical development scenarios, the evaluation determined that private sector enterprises related to industrial projects perceived brownfield redevelopment as less cost-effective and more hazardous than greenfield development. In contrast, the evaluation also discovered that private sector enterprises related to residential projects perceived brownfield redevelopment as more cost-effective and less hazardous than greenfield development. The study also determined that minor alterations to policy could encourage an increase in residential brownfield redevelopment, however, the widespread acceptance of industrial brownfield redevelopment will only increase with drastic alterations to environmental policy incorporating economic incentives.

De Sousa, C. 2001. Contaminated sites: The Canadian situation in an international context. *Journal of Environmental Management* 62: 131 – 154.

Private developers have typically neglected brownfields due to complex regulations, unknown soil conditions, costly and stringent remediation standards, liability concerns, and lack of funding. De Sousa (2001) evaluates policy in Canada intended to promote brownfield redevelopment by private enterprise. The author then compares policy in Canada versus policy in the United States and Europe. It is determined that policies promoting private brownfield redevelopment employ similar strategies in Canada and abroad. This is a reflection of governments recognizing that they must compensate private companies for the costs and liabilities associated with brownfield redevelopment. Also, the author determines that policy in Canada is adopted at a slower rate than in other countries.

De Sousa, C.A. 2004. The Greening of Brownfields in American Cities. *Journal of Environmental Planning and Management* 47 (4): 579 – 600.

De Sousa (2004) introduces brownfields as the focal element of government activities to rejuvenate dilapidated urban areas of the United States. Brownfield redevelopment initially promoted land uses based solely upon socioeconomic improvement. In a recent trend, some US cities have begun to support transforming brownfields into outdoor recreational areas intended to enhance both socioeconomic as well as environmental conditions. The paper discusses the results of a survey examining the transformation of 20 brownfields into outdoor recreational areas. Results from this survey reveal the primary concerns encountered when converting a brownfield into a park or open space, benefits derived from such redevelopment, and planning required for successful implementation.

De Sousa, C.A. 2002. Measuring the public costs and benefits of brownfield versus greenfield development in the Greater Toronto area. *Environment and Planning B: Planning and Design* 29: 251 – 280.

Public costs and benefits related to both brownfield redevelopment and greenfield, naturally preserved areas, development are compared by the study summarized in this paper. Environmental, social, and economic costs and benefits accumulated by publicly operated projects in Toronto were examined for the purpose of constructing a cost-benefit comparison between brownfield redevelopment and greenfield development. The cost-benefit comparison referred to four common development scenarios in an effort to quantitatively model the public costs and benefits associated with specific types of projects. It was determined that the model was useful for estimating the actual costs and benefits associated with a development project. This information could assist policymakers in assessing the economic feasibility of a development project.

De Sousa, C. 2005. Policy Performance and Brownfield Redevelopment in Milwaukee, Wisconsin. *The Professional Geographer* 57 (2): 312 – 327.

De Sousa (2005) critically assesses brownfield redevelopment projects in Milwaukee County, Wisconsin, an initiative that gained momentum in the area during the mid-1990s. In particular, the author examines the influence of government involvement on such redevelopment projects. To determine the influence of government involvement, the author reviewed government data and conducted interviews with primary stakeholders. Results from this research revealed that brownfield redevelopment is progressing in a positive direction in part due to government advances in removing the barriers for private sector investments. The author also determined that redevelopment performance is still primarily measured by economic productivity. It is suggested that brownfield redevelopment performance should be measured according to social and environmental objectives along with economic productivity.

De Sousa, C.A. 2006. Unearthing the benefits of brownfield to green space projects: An examination of project use and quality of life impacts. *Local Environment* 11 (5): 577 – 600.

De Sousa (2006) acknowledges that brownfields redevelopment and the reintroduction of green space in urban communities of the United States have become increasingly complimentary efforts. These two intertwined activities are perceived as essential elements of urban revitalization projects and sustainable communities. The redevelopment of brownfields into green space has encountered a pair of impediments. Typically, the most desirable brownfields redevelopment projects produce direct economic benefits, and the benefits of transforming brownfields into green space have yet to be widely assessed and documented. The paper is an attempt to assess the value of three brownfield to green space conversions. To assess the impact of these conversions on quality of life, the author gathered perceptions on the redevelopment projects in the form of a question and answer survey distributed to the three separate communities. Results from the survey revealed that these projects are regularly used upon completion and users participate in a variety of recreational outlets. Overall, it was determined that quality of life in the three communities was enhanced through the brownfields to green space conversions.

De Sousa, C.A. 2006. Urban brownfields redevelopment in Canada: the role of local government. *The Canadian Geographer* 50 (3): 392 – 407.

Brownfield redevelopment in Canada has progressed at a slower rate than in the U.S. due to stakeholder apprehension. Ongoing apprehension has resulted from inadequate and fragmented government policies that have failed to alleviate the risks associated with brownfield redevelopment. De Sousa (2006) evaluates brownfield redevelopment in Canada and the role of local government in the brownfield redevelopment process. A survey of data from 24 different cities confirmed that brownfields in Canada represent critical environmental and economic problems to urban communities. A review of the data revealed that brownfield redevelopment on a local level could be improved using similar measures throughout Canada. Disparate provincial policies and differing property markets have contributed to the current lack in brownfield redevelopment progress in Canada.

Doick, K.J., G. Sellers, V. Castan-Broto, and T. Silverthorne. 2009. Understanding success in the context of brownfield greening projects: The requirement for outcome evaluation in urban greenspace success assessment. *Urban Forestry & Urban Greening* in press.

Many European governments, including the United Kingdom, have increasingly encouraged the creation of public access greenspaces through brownfield redevelopment. In the United Kingdom, several brownfield conversions into greenspaces have recently failed to fulfill their designated functions. Such failures are the result of a lack in funding to maintain the property for its public greenspace function. Authors of this article applied the 'general organizational logic framework' model to six case studies within the United Kingdom. It was determined that the success of brownfield to greenspace conversions should be measured by the long-term outcomes of the project. In each case study, the converted property's greenspace functionality was rendered unsustainable by insufficient long-term monitoring, evaluation, funding, and

maintenance. Results from this research support the need for ongoing funding, monitoring, evaluation, and maintenance at sites converted from brownfields to public greenspaces. Funding, monitoring, evaluation, and maintenance invested in such properties will enhance their long-term sustainability.

Dorsey, J.W. 2003. Brownfields and Greenfields: The Intersection of Sustainable Development and Environmental Stewardship. *Environmental Practice* 5: 69 – 76.

Dorsey (2003) is supportive of recent trends to redevelop brownfields and conserve greenfields. The article provides evidence in support of these land use strategies. Urban brownfield redevelopment and greenfield conservation promote sustainability over unrestricted resource exploitation and unsustainable economic growth. Brownfield redevelopment improves the economic conditions and public health of suffering communities. The negative impacts of suburban sprawl are also avoided through urban brownfield redevelopment. Urban planning strategies known as 'smart growth' and 'urban infill' have embraced brownfield redevelopment to prevent suburban sprawl and revive dilapidated city centers. The brownfield redevelopment trend is a positive influence on urban spaces, community revitalization, historic preservation, and greenfield conservation.

Gallagher, D.R. and S.E. Jackson. 2008. Promoting community involvement at brownfields sites in socio-economically disadvantaged neighbourhoods. *Journal of Environmental Planning and Management* 51 (5): 615 – 630.

Gallagher and Jackson (2008) encourage the involvement of private sector remediation and real estate expertise when redeveloping brownfields in economically depressed communities. This paper examined how these private sector brownfield developers involve disadvantaged community members in the redevelopment process. The research also investigated how these developers are increasing awareness and creating an open forum for community members to influence brownfield redevelopment decision making. Data collected from brownfield sites in four US cities revealed that developers have the capacity to shape redevelopment outcomes that benefit both themselves as well as the surrounding community. The authors conclude that long-term support for brownfield projects is often achieved when the community is an involved party in the redevelopment.

Gorovitz-Robertson, H. 1999. One Piece of the Puzzle: Why State Brownfields Programs Can't Lure Businesses to the Urban Cores Without Finding the Missing Pieces. *Rutgers Law Review* 51 (5): 1075.

An array of government agencies has committed significant amounts of time and money in the effort to promote urban renewal through brownfield redevelopment. Private sector brownfield redevelopment has been encouraged through reformed government regulations that reduce remediation costs and liability concerns. The author argues that these incentives only address one component of a viable urban renewal strategy.

Greenberg, M.R. and J. Hollander. 2006. The Environmental Protection Agency's Brownfields Pilot Program. *American Journal of Public Health* 96 (2): 277 – 281.

The research for this paper investigated the United States Environmental Protection Agency's (USEPA) Brownfields Pilot Program administered to more than 300 local governments between 1993 through 2002. Specifically, the research was concerned with why some local governments were awarded grants earlier than others. An ordinal regression analysis that considered defining features of all local governments awarded these grants was performed along with interviews with representatives from the local governments that received early funding. Through these two separate research components, it was determined that the early grant recipients consisted of local governments that had recently lost their manufacturing base. Also, it was determined that the early grant recipients contained significant portions of minority residents experiencing financial difficulties. Finally, the research revealed that early grant recipients were the most capable of competing for federal funding. The authors conclude that the Brownfields Pilot Program initially distributed funding more discriminatingly and later the Program's funding was dispersed based on local need.

Greenberg, M.R. and L. Issa. 2005. Measuring the success of federal government's Brownfields Program. *Remediation* 15 (3): 83 – 94.

Greenberg and Issa (2005) assess the performance of the federal government's Brownfields Program a decade after its inception. Through 2002, grants of approximately $200,000 each had been distributed to 436 local governments. This funding outlet has also supplied state and regional governmental agencies as well as private organizations for the purpose of both redeveloping and researching brownfields. Grant money was typically invested in economically depressed communities composed of minority populations living amongst an overabundance of abandoned and typically contaminated properties. The authors determined that the distribution of grants was not solely influenced by a legacy of contaminated sites. Funds were more frequently awarded to larger cities with personnel more capable of composing a competitive grant application. Also, larger cities were more likely to be aware of the grant opportunity and are generally more connected to important decision makers. Despite perceived geographical funding disparities, the authors conclude that overall the program has been effective at motivating private enterprise to redevelop brownfields.

Greenberg, M.R. and M.J. Lewis. 2000. Brownfields Redevelopment, Preferences and Public Involvement: A Case Study of an Ethnically Mixed Neighbourhood. *Urban Studies* 37 (13): 2501 – 2514.

The article discusses a survey that sampled over 200 residents of a predominantly Hispanic census tract located in Perth Amboy, New Jersey. The purpose of the survey was to determine how the residents would prefer to redevelop brownfields and how much the residents were willing to participate in redevelopment activities. Results from the survey revealed that sampled residents typically desired recreational and cultural facilities for community activities. This desire was then followed by new housing. Residents were least in favor of new industry and commercial uses. Three-quarters of the sampled residents wanted to actively participate in the redevelopment activities. As expected, these residents were more optimistic of redevelopment

outcomes, apprehensive of authority and their intentions, and did not appreciate the presence of brownfields within the community. Despite the overwhelming tendency for US brownfield redevelopment to encourage industrial and commercial uses, the survey indicated that community members preferred other uses such as recreational or cultural facilities. Industrial and commercial brownfield redevelopments will only be sustainable with community support. Local government and business must involve community stakeholders to gain support for commercial and industrial brownfield redevelopment projects. Conversely, brownfield redevelopment should also consider community opinion and provide recreational and cultural facilities.

Greenberg, M.R., P. Craighill, H. Mayer, C. Zukin, and J. Wells. 2001. Brownfield Redevelopment
and Affordable Housing: A Case Study of New Jersey. *Housing Policy Debate* 12 (3): 515 – 540.

The authors conducted a survey of 779 New Jersey residents to gauge public opinion regarding housing constructed on brownfields that pose no immediate health risks. The researchers discovered that only fourteen percent of the survey's respondents would be willing to reside on a redeveloped brownfield. The majority of these respondents were non-affluent urbanites residing in cities promoting brownfield redevelopment. Survey participants willing to relocate on to a redeveloped brownfield were also typically dissatisfied with their current living situation and accepted the opinion of experts on the health risks associated with living on a reclaimed brownfield.

Greenberg, M.R., K. Lowrie, H. Mayer, K.T. Miller, and L. Solitare. 2001. Brownfield redevelopment as a smart growth option in the United States. *The Environmentalist* 21 (2): 129 – 143.

The viability of brownfield redevelopment as a smart growth policy is compared to other commonly used smart growth policies such as green belts, suburban sprawl restrictions, altering transportation methods, and compact urban planning close to city limits. Greenberg et al. (2001) identifies the advantages of brownfield redevelopment as environmental protection, moral imperative, and acceptance by government agencies and special interests. Aside from these advantages, other aspects of brownfield redevelopment such as economic feasibility, ability to adopt innovative technology, and public acceptance remain largely unpredictable and lack sufficient research. The future success of the brownfield redevelopment movement as a viable smart growth policy is dependent upon continued research investigating remediation costs and public opinion of housing options on reclaimed property.

Green Leigh, N. and S.L. Coffin. 2005. Modeling the Relationship among Brownfields, Property Values, and Community Revitalization. *Housing Policy Debate* 16 (2): 257 – 280.

Due to limited funding, the authors argue that brownfield redevelopment should be prioritized according to the foreseeable improvement to residential property values. Available funding prohibits all brownfields from being redeveloped. In light of this, the authors seek to prioritize brownfield redevelopment projects according to their impact on surrounding property values. To

estimate the impact of brownfields on surrounding property values, hedonic modeling was implemented. Results from the hedonic modeling indicated that a short-term economic outlook is an inappropriate approach to redeveloping brownfields.

Harrison, C. and G. Davies. 2002. Conserving biodiversity that matters: practitioners' perspectives on brownfield development and urban nature conservation in London. *Journal of Environmental Management* 65: 95 – 108.

In the United Kingdom, brownfields are disproportionately redeveloped for commercial or industrial uses. However, conservationists view brownfield redevelopment as an opportunity to enhance urban biodiversity and create habitat. Harrison and Davies (2002) address how conservationists have been responding to brownfield redevelopment policy, which is overwhelmingly in favor of commercial or industrial uses. Conservation professionals were interviewed to determine how they proposed to shift brownfield redevelopment in favor of habitat creation and preservation. The interviews revealed that conservationists are still uncertain as to how they should promote biodiversity and habitat creation through brownfield redevelopment. Conservationists would be able to confidently assume a role during brownfield redevelopment if they were capable of determining the conservation importance of the contaminated site.

Heberle, L. and K. Wernstedt. 2006. Understanding Brownfields Regeneration in the US. *Local Environment* 11 (5): 479 – 497.

The authors investigate emergent federal, state, and local initiatives promoting beneficial uses of brownfields. The socioeconomic benefits associated with redeveloping brownfields such as community sustainability, frontier markets, and improved quality of life support these initiatives. The purpose of the paper is to examine the current status of brownfield initiatives and provide recommendations based on the problems encountered during actual redevelopment projects. The paper outlines ten propositions for improving the brownfield redevelopment process. The authors conclude by linking regional efforts at brownfield redevelopment to community sustainability.

Howland, M. 2003. Private Initiative and Public Responsibility for the Redevelopment of Industrial Brownfields: Three Baltimore Case Studies. *Economic Development Quarterly* 17 (4): 367 – 381.

This study examined the rehabilitation of three sites for the purpose of determining the differences between publicly and privately operated brownfield redevelopment. Site rehabilitations were conducted by publicly operated local governments as well as private enterprises. Howland (2003) discovered that the private sector is more likely to facilitate redevelopment on sites in which market conditions are robust, contamination is less severe, and redevelopment is for industrial purposes. On sites in which industrial contaminations are mitigated for residential land uses, expected economic gains are less profitable, and complex remediation tasks are required, it is more likely that public subsidies and management will be invested in the redevelopment project.

Lafortezza, R. R.C. Corry, G. Sanesi, and R.D. Brown. 2008. Visual preference and ecological assessments for designed alternative brownfield rehabilitations. *Journal of Environmental Management* 89: 257 – 269.

Lafortezza et al. (2008) discusses a method for quantitatively and comparatively assessing the results of alternative brownfield redevelopment projects. This method was practically applied to a major industrial area in southern Italy. Within the paper, alternative brownfield redevelopment projects consist of four techniques including introduction of ground cover plant species, ground cover species interspersed with a limited amount of trees, ground cover species mixed with small patches of trees, and ground cover species covered by several dense patches of trees. Cost-surface modeling (CSM) and visual preference assessment (VPA) were used to compare the various techniques to each other and baseline conditions. Results from the CSM and VPA revealed that alternatives able to restore ecological functions and avian populations were more visually appealing. The ecological functions and aesthetics of brownfield redevelopment projects were improved using the modeling techniques described by Lafortezza et al. (2008).

McCarthy, L. 2002. The brownfield dual land-use policy challenge: reducing barriers to private redevelopment while connecting reuse to broader community goals. *Land Use Policy* 19 (4): 287 – 296.

The article addresses the dual land use policy challenge encountered when the public sector commits to a brownfield redevelopment strategy. The public sector must promote private sector brownfield redevelopment projects through policies that relax legal liabilities, provide funding, and clearly state complicated remediation requirements. Brownfield redevelopment policies must also promote sometimes contradictory goals to protect the public and environment from contaminations, metropolitan area projects, and prevent sprawling city limits. McCarthy (2002) evaluates the brownfield redevelopment policies adopted by various US government agencies in the context of the dual land use challenge discussed above. The author's evaluation is based on a literature review of brownfield redevelopment articles and case studies from Toledo, Ohio.

Meyer, P.B. and T.S. Lyons. 2000. Lessons from Private Sector Brownfield Redevelopers. *Journal of the American Planning Association* 66 (1): 46 – 57.

Traditionally, urban brownfield renewal projects have been non-competitive and managed by government agencies. A more recent trend has witnessed the emergence of private development firms solely responsible for brownfield renewal projects. Public support of such activities should be promoted by examining the private firms undertaking brownfield redevelopment projects. Meyer and Lyons (2000) discuss the results of a survey that examined private developers willing to rejuvenate brownfields. Results from the survey revealed that municipal planners can both negatively and positively influence privately managed redevelopment projects. Site conditions, public opinion of a redevelopment project, and the characteristics of the private development firm must all be considered by municipal planners when attempting to encourage brownfield redevelopment through non-governmental organizations.

Meyer, P.B. and H.W. VanLandingham. 2000. *Reclamation and Economic Regeneration of Brownfields*. Louisville, Kentucky: The E.P. Systems Group, Inc.

This document was the product of a Cooperative Agreement between the Economic Development Administration and The E.P. Systems Group, Inc. The purpose of the document was to provide a comprehensive literature review of economic development opportunities and initiatives related to brownfield redevelopment. To compliment the literature review, the authors also discuss specific brownfield redevelopment projects from a personal perspective. Both the literature review and discussion of personal experiences in brownfield redevelopment address the common problems encountered when attempting to convert a site perceived as contaminated into a positive socioeconomic element of the community.

Nijkamp, P., C.A. Rodenburg, and A.J. Wagtendonk. 2002. Success factors for sustainable urban brownfield development: A comparative case study approach to polluted sites. *Ecological Economics* 40: 235 – 252.

In recent history, sustainable urban land uses have been increasingly threatened by soil contamination. The critical success factors for remediation policy on contaminated lands are identified by Nijkamp (2002). A qualitative impact assessment model is presented that provides viable remediation targets on a site-specific basis. To test the feasibility of the model, it was then applied to sites containing contaminated soils in The Netherlands. In addition to the model, meta-analytic techniques for comparative research were implemented to identify elements that contribute to the success of brownfield redevelopment policy. Using this method, researchers were able to identify a set of conditions that would result in the success of a specific brownfield redevelopment policy.

Rowan, G.T. and C. Fridgen. 2003. Brownfields and Environmental Justice: The Threats and Challenges of Contamination. *Environmental Practice* 5: 58 – 61.

The article defines environmental justice as an ongoing effort to provide equitable access to healthy environments free from the risks associated with toxic contaminants. Communities most at risk from such contaminants are commonly inhabited by minorities or the impoverished. Other than the risks from contaminants, these communities are also negatively impacted by the presence of structurally compromised buildings, inadequate education, unemployment, elevated crime rates, and degraded transportation infrastructure. Rowan and Fridgen (2003) discusses these issues and provides policy recommendations for brownfield redevelopment intended to improve current conditions and resolve environmental inequalities.

Schwarz, P.M., C.A. Depken II, A. Hanning, and K. Peterson. 2009. Comparing contaminated property redevelopment for mandatory and Voluntary Cleanup Programs in California. *Journal of Environmental Management* in press: 1 – 6.

Schwarz et al. (2009) analyzed data from the state of California to compare mandatory versus voluntary site remediation. Sites requiring mandatory remediation qualify for the CERCLA liability approach, while voluntary remediation sites permit higher contaminant levels for properties with non-residential redevelopment plans. This policy is intended to promote a higher

proportion of industrial redevelopment projects as opposed to residential redevelopment. Results from the analysis indicated that the overall trend is toward residential redevelopment, however, that trend significantly diminishes for sites participating in voluntary remediation.

Sherman, S. 2002. Government Tax and Financial Incentives in Brownfields Redevelopment: Inside the Developer's Pro Forma. *New York University Environmental Law Journal* 11: 317.

Participants in environmental law, urban revitalization, and real estate all function to redevelop brownfields for various purposes. The environmentally concerned brownfield redeveloper emphasizes effective remediation activities and the appropriate distribution of liability costs. Brownfield redevelopers focused on urban revitalization seek to revive economically depressed areas and return the property to a productive use that will contribute to the tax rolls. Real estate interests in brownfield redevelopment attempt to create diversified investment portfolios and above market financial returns. Government officials have acknowledged the need to redevelop brownfields and revised certain regulations to encourage redevelopment projects. Revised regulations include risk-based remediation requirements dictated by redevelopment plans and relaxed liability concerns. These revised regulations encourage brownfield redevelopment through increased financial incentives and less financial risk.

Siikamaki, J. and K. Wernstedt. 2008. Turning Brownfields into Greenspaces: Examining Incentives and Barriers to Revitilization. *Journal of Health Politics, Policy and Law* 33 (3): 559 – 593.

A series of interviews, literature review, and a national survey of local government officials were conducted to identify the factors that influence the success of brownfield to green space redevelopment projects. Findings from the above research efforts indicate that contamination associated with brownfields continue to dissuade redevelopment projects despite governmental policies intended to ease liability concerns. Local government entities are more likely to convert brownfields into recreational parks rather than open space provided that the state is in support of the redevelopment project. It was also determined that community support is more readily achieved if the project is funded through a combination of private and public sources. Redevelopment sites surrounded by residential land uses are also more likely to garner community support.

Smith, D.W. and S.J. Stanley. 1995. Development of Cleanup Protocol for Contaminated Sites in Canada. *Journal of Professional Issues in Engineering Education and Practice* 121 (1): 67 – 70.

Due to increasing concerns regarding environmental and human health impacts from contaminated industrial sites, the environmental engineer will be increasingly responsible for contamination assessments and remediation. Besides regulatory compliance, the environmental engineer must also be concerned with liability issues, remediation standards and requirements, and public health protection. The authors provide a critical summary of the remediation requirements for brownfields in Canada. The summary discusses the advantages and

disadvantages associated with how the Canadian remediation requirements were developed. The summary is also accompanied by a discussion of how environmental liability and remediation standards dictate contaminated site redevelopment decisions.

Solitare, L. and M. Greenberg. 2002. Is the U.S. Environmental Protection Agency Brownfields Assessment Pilot Program Environmentally Just? *Environmental Health Perspectives* 110 (2): 249 – 257.

To determine if the U.S. Environmental Protection Agency's (USEPA) Brownfields Assessment Pilot Progam is environmentally just, the authors determined if the most economically depressed communities received funding from the program. Communities that received funding from the program were compared to those that did not using 1990 U.S. Census of Housing and Population data. The study confirmed that the USEPA's Brownfields Assessment Pilot Program was indeed environmentally just because it typically awarded grant monies to the most economically depressed communities. The study also determined that communities awarded funding in the earlier years of the program were more economically depressed than those that received funding in the later years.

Sounderpandian, J., N. Frank, and S. Chalasani. 2005. A support system for mediating brownfields redevelopment negotiations. *Industrial Management and Data Systems* 105 (2): 237 – 254.

The purpose of this article was to introduce and discuss a decision support system designed to assist brownfield redevelopment negotiations between government and private organizations. A weighted utility function is used to determine the optimal redevelopment solution. It also generates sensitivity reports to effectively guide the redevelopment negotiations. The researchers discovered that this decision support system is effective at providing optimal solutions in real time, which allows the mediator to guide the negotiations in the most efficient manner. This paper represents the first to discuss and evaluate a decision support system for brownfield redevelopment projects.

Swickard, T.J. 2008. Regulatory Incentives to Promote Private Sector Brownfield Remediation and Reuse. *Soil and Sediment Contamination: An International Journal* 17 (2): 121 – 136.

In industrialized nations, aging urban interiors contain an increasing amount of degradation due to site contamination produced by previous industrial activity. These brownfield sites are the source of environmental degradation on two fronts, the urban interior in which the contamination has occurred and the resultant urban expansion that occurs on the metropolitan fringe. Resolving both fronts of the brownfield problem can be accomplished through private sector redevelopment projects. Projects of this nature have been impeded by environmental regulations and laws assigning liability for past contaminations to the current owner. In response to this impediment, the author explores five governmental polices intended to promote private sector brownfield redevelopment.

Thornton, G., M. Franz, D. Edwards, G. Pahlen, and P. Nathanail. 2007. The challenge of sustainability: incentives for brownfield regeneration in Europe. *Environmental Science and Policy* 10: 116 – 134.

Without public intervention, brownfield redevelopment is often less economically competitive than greenfield development. European nations recognize the brownfield problem and offer public incentive to encourage redevelopment projects. These policies are based on immediate returns and rarely consider sustainability. Brownfield redevelopment should consist of more than simply remediating the site and installing the predetermined land use. Thornton et al. (2007) argues that both public and private initiatives should be aware of sustainability issues when selecting brownfield redevelopment alternatives. This paper examines current brownfield incentives in Europe and their neglect of sustainability. Suggestions are then provided to improve the sustainability of incentive-based brownfield redevelopment projects.

Tiesdell, S. and D. Adams. 2004. Design matters: major house builders and the design challenge of brownfield development contexts. *Journal of Urban Design* 9 (1): 23 – 45.

In England, it is commonly observed that residential designs are of higher quality on smaller scales like those provided by restricted urban spaces and brownfield sites. Innovative and quality residential designs are less frequently observed on the large scale settings provided by greenfield sites. Tiesdell and Adams (2004) attempt to explain this phenomenon in the context of the brownfield redevelopment movement that gained widespread acceptance during the 1990s. The design concept known as 'opportunity space' is used to explain why residential developments on brownfields and other restricted spaces are typically of higher quality than those on unrestricted greenfield sites. The authors suggest that the greenfield and brownfield development processes are fundamentally different, and brownfield developers are more prone to encourage the use of 'opportunity space' in design concepts.

Wedding, G.C. and D. Crawford-Brown. 2007. Measuring site-level success in brownfield redevelopments: A focus on sustainability and green building. *Journal of Environmental Management* 85: 483 – 495.

Wedding and Crawford-Brown (2007) designed an automated system for evaluating the viability of brownfield redevelopment projects. Four research objectives were accomplished during this study. The researchers identified forty factors that influence the success of brownfield redevelopment. These factors were then used to develop an automated system for evaluating individual brownfield redevelopment projects. Elements of green building in brownfield redevelopment were considered especially important during project evaluation. Finally, the automated evaluation system was tailored to a multi-attribute decision method framework. Future research should apply the automated evaluation system developed during this study to specific sites.

Wernstedt, K., P.B. Meyer, and K.R. Yount. 2003. Insuring Redevelopment at Contaminated Urban Properties. *Public Works Management and Policy* 8 (2): 85 – 98.

The authors assessed the effectiveness of environmental insurance (EI), a form of insurance intended to facilitate the redevelopment of potentially contaminated sites. EI was evaluated through a survey and a series of interviews with private brownfield developers. The researchers discovered that EI is particularly applicable for sites in which high-risk financing capital is employed, off-site contaminant migration is possible, and institutional controls have been heavily implemented. The application of EI should be promoted through the proper informational channels.

Winson-Geideman, K., R.A. Simons, and J. Pendergrass. 2004. Tracking Remediation and Redevelopment Trends of Brownfield Clean-up Programmes: The Cook County Experience. *Journal of Environmental Planning and Management* 47 (3): 393 – 405.

The authors evaluated the remediation and redevelopment of properties in Cook County that participated in two different Illinois Voluntary Cleanup Programs (VCPs). To do so, a sample of several hundred properties that participated in the VCPs was monitored from the remediation stage through redevelopment. Over half of the sampled properties underwent successful remediation and received closure letters declaring that the pre-existing contamination had been sufficiently removed. Approximately one-quarter of the sampled properties were subjected to more thorough remediation techniques required for residential redevelopment. Engineering techniques such as caps were applied to one-third of the sampled properties. One-fifth of those properties that received closure letters acquired additional financing for redevelopment plans. Results from this study indicate that VCPs in the state of Illinois are effective at transforming brownfields into productive properties.

Brownfields and Public Health

Greenberg, M. 2002. Should Housing Be Built on Former Brownfield Sites? *American Journal of Public Health* 92 (5): 703 – 705.

Greenberg (2002) considers the arguments for and against residential uses of brownfields. Arguments for residential uses promote remediated brownfields as a ready source of developable land. Commercial uses of remediated brownfields are often not feasible because the sites are situated in a residential neighborhood, the sites are too small or oddly shaped, or the site's infrastructure is inadequate for commercial use. Therefore, residential uses are frequently the sole option for many brownfield redevelopment projects. It has also been discovered that many sites perceived as contaminated are not actually contaminated. In these instances, it would be permissible to redevelop the abandoned site into residences. Arguments against transforming brownfields into residential uses are typically centered upon the greed and haphazard tendencies of some residential developers. After discussing arguments for and against residential brownfield redevelopment, the author presents suggestions to ensure public health when redeveloping a brownfield for residential use.

O'Reilly, M. and R. Brink. 2006. Initial Risk-Based Screening of Potential Brownfield Development Sites. *Soil and Sediment Contamination: An International Journal* 15 (5): 463 – 470.

The authors argue that sustaining the brownfield redevelopment movement will depend on transparent processes aimed at protecting public health. Prior to redevelopment, a risk assessment should be conducted that determines the public health threats of the proposed brownfield project. A risk assessment should also be completed that determines the public health threats of failing to redevelop a brownfield. O'Reilly and Brink (2006) identify protecting public health as the primary barrier to redeveloping brownfields. For the purpose of protecting public health, the authors suggest using a risk screening matrix tailored to the specific brownfield in question. As an example of this, the paper discusses a risk matrix developed by a citizens' advisory group for a southern New York county.

Tedd, P., J.A. Charles, and R. Driscoll. 2001. Sustainable brownfield re-development – risk management. *Engineering Geology* 60: 333 – 339.

Tedd et al. (2001) assessed the potential risks posed by actually contaminated brownfields. The study determined that there are three basic systems at risk when redeveloping a brownfield. These systems were identified as the human population, the natural environment, and the built environment. To ensure sustainable brownfield redevelopment, the risks associated with each of these three systems must be addressed. After presenting the risk management framework for sustainable brownfield redevelopment, the authors discuss two case studies in which the risks associated with a contaminated site were successfully abated. The authors conclude by emphasizing the importance of risk assessment when attempting to sustainably redevelop brownfields.

Appendix C

Annotated Bibliography on Special Taxation Districts

Annotated Bibliography on Special Taxation Districts

Geoffrey Fouad

07/29/2009

Cardno TBE

USF UNIVERSITY OF SOUTH FLORIDA

Tax Policies for Urban Redevelopment

Tax Increment Financing (TIF)

Anderson, J.E. 1990. Tax Increment Financing: Municipal Adoption and Growth. *National Tax Journal* 43 (2): 155 – 163.

Tax increment financing (TIF) is an economic development technique typically employed by municipal government. TIF is commonly applied to economically depressed urban areas selected for redevelopment initiatives. Anderson (1990) identifies municipalities that have funded redevelopment efforts through TIF. Anderson (1990) then examines the influence of TIF-funded redevelopment projects on property value. A structural probit model was used to assess the impact of TIF on property value and what type of city is more likely to adopt TIF. Results from the model revealed that TIF is most commonly adopted by rapidly growing cities requiring funds for economic development projects. The model was not conclusive in determining if TIF is a mechanism for urban redevelopment and economic stimulus.

Byrne, P.F. 2006. Determinants of Property Value Growth for Tax Increment Financing Districts. *Economic Development Quarterly* 20 (4): 317 – 329.

The majority of empirical research on tax increment financing (TIF) focuses on municipal-level impacts. Byrne (2006) examines the impacts of TIF on a more localized scale. The author identifies common characteristics shared by TIF districts and factors that impact property value appreciation within TIF districts. The research revealed that TIF districts are commonly located in economically depressed areas. The research also revealed that TIF had a greater positive impact on property value appreciation in more economically depressed areas. Results from the study indicated that property value appreciation shared a positive relationship with the spatial size of the TIF district. Property value appreciated at higher rates for TIF districts with larger surface areas. Industrial TIF districts and low-density TIF districts situated in close proximity to the city center typically experienced higher growth rates.

Byrne, P.F. 2005. Strategic interaction and the adoption of tax increment financing. *Regional Science and Urban Economics* 35 (3): 279 – 303.

Byrne (2005) identifies the characteristics of a municipality prone to engaging in tax increment financing (TIF). The author particularly focuses on how cities typically decide to implement TIF and if TIF is commonly used to acquire property tax revenue from overlapping jurisdictions. The underlying objective of this research was to determine if TIF is implemented by neighboring municipalities competing for private development. Results from the study revealed that TIF is frequently used by neighboring municipalities to compete for private investors, however, competing municipalities do not use TIF to acquire property tax revenue from overlapping jurisdictions.

Carroll, D.A. 2008. Tax Increment Financing and Property Value. *Urban Affairs Review* 43 (4): 520 – 552.

The influence of tax increment financing (TIF) on business property value is discussed in Carroll (2008). Property value data retrieved from Milwaukee, Wisconsin during the years 1980 to 1999 was analyzed by a semilog econometric model based on fixed effects regression. To circumvent potential self-selection bias and endogeneity related to TIF implementation, a dual stage modeling technique was applied. Model results indicate that public services provided by TIF districts are included in business property value after a certain amount of time. The model primarily considered the degree to which TIF-provided public services improve business property values. As suspected, the self-selection bias is identified by the model as being associated with TIF implementation. The model revealed a positive correlation between the potential for a business property to be incorporated into a TIF district and the property's perceived value. The influence of TIF on business property values is frequently underestimated due to the self-selection bias and endogeneity.

Carroll, D.A. and R.J. Eger. 2006. Brownfields, Crime, and Tax Increment Financing. *The American Review of Public Administration* 36 (4): 455 – 477.

Property values in a central city location are determined by land and demand features. In addition to land and demand features, central city property values are also determined by neighborhood health and quality of life considerations such as crime and environmental contamination. To promote a positive economic climate, central cities must not only be concerned with commercial development and providing public services, but they must also be concerned with increasing property values through local governmental policies such as tax increment financing (TIF). Carroll and Eger (2006) evaluate TIF as it pertains to neighborhood health and quality of life. This study was particularly concerned with how TIF impacts neighborhood crime and brownfield rehabilitation. The authors present empirical evidence that TIF increases property value appreciation rates, which is an effective technique for reducing crime and redeveloping brownfields.

Davis, D. 2003. Tax Increment Financing. *Public Budgeting and Finance* 9 (1): 63 – 73.

Urban redevelopment generally results in an increase in the property tax base. Tax increment financing (TIF) captures the revenue generated from an increased property tax base and subsidizes further redevelopment projects. Davis (2003) describes how TIF functions and the problems associated with using actual property tax increments under Illinois law. The paper also examines two different methods for estimating tax increments, the 'aggregate' and 'parcel' methods. These concepts are then illuminated by a succinct TIF case study.

Donaghy, K.P., A.K. Elson, and G.J. Knaap. 1999. Optimal investment in a tax increment financing district. *The Annals of Regional Science* 33 (3): 305 – 326.

Donaghy et al. (1999) presents a general framework for urban redevelopment using tax increment financing (TIF). The framework demonstrates that improved public infrastructure and residential development promote private investment and increased property values. The question of how to best manage TIF-generated revenue for urban redevelopment purposes is also discussed. The appropriate use of TIF-generated revenue is then identified for a special taxation district located in Urbana, Illinois. The authors also evaluate the TIF's suitability for the specific case study in Urbana.

Dye, R.F. and D.F. Merriman. 1999. *The Effects of Tax Increment Financing on Economic Development*. Chicago, Illinois: Institute of Government and Public Affairs, University of Illinois, Chicago.

Property taxes are commonly used by local governments to promote private investment and economic development. Tax increment financing (TIF) collects property tax revenue generated from growth in assessed valuation. Revenue generated from TIF is typically allocated to economic development projects. Dye and Merriman (1999) examined the effect of TIF on property value growth for the Chicago metropolitan area. An extensive data set was compiled to assess the impact of TIF on property value. This data set included property value information recorded before and after TIF was established in the study area. Results contradicted conventional wisdom and indicated that TIF slows urban development. Sample selection bias was tested for and rejected to further support this unexpected finding. A theoretical argument is then presented to explain how TIF could be responsible for slowing urban development.

Dye, R.F. and J.O. Sundberg. 1998. A Model of Tax Increment Financing Adoption Incentives. *Growth and Change* 29: 90 – 110.

Tax increment financing (TIF) funds economic stimulus projects with future increases in property tax revenue. Dye and Sundberg (1998) argue that TIF is a fiscally fair urban redevelopment policy if the economic stimulus produced by the TIF is the only cause of the increased property tax revenue. If this condition is not satisfied, TIF can be responsible for falsely influencing redevelopment decisions and inequitable resource distribution. The paper presents an economic model that was used to evaluate the impacts from TIF. The model examined key variables dictating the amount of revenue generated from TIF and its distribution amongst government agencies. Results from the model indicate that TIF appeals to projects that produce significant tax revenue, however, these projects do not necessarily have to be efficient to be financially lucrative for municipalities. The model also indicated that the amount of revenue generated from TIF is insufficient to fund the types of projects most compatible with TIF objectives. The

paper concludes by suggesting that municipalities explore alternative methods other than TIF for funding urban redevelopment projects.

Gibson, D. 2003. Neighborhood characteristics and the targeting of tax increment Financing in Chicago. *Journal of Urban Economics* 54 (2): 309 – 327.

The neighborhood selection process for tax increment financing (TIF) districts was evaluated by Gibson (2003) using the Weibull duration modeling technique. Results generated by the model indicate that neighborhoods under more economic distress benefit least from being included in a TIF district. In some instances, the most distressed neighborhoods are harmed by being included in a TIF district. The author also discusses the relationship between Empowerment Zones and a neighborhood's political influence.

Huddleston, J.R. 1986. Distribution of Development Costs Under Tax Increment Financing. *Journal of the American Planning Association* 52 (2): 194 – 198.

The use of tax increment financing (TIF) requires that economic development planners recognize the financial relationships between municipalities, other local governments, and taxpayers. Huddleston (1986) performed a flow-of-funds analysis for TIF programs implemented by nine municipalities in Milwaukee County, Wisconsin. The flow-of-funds analysis revealed that taxpayers in certain communities tend to pay more in tax increments than they would have paid by financing redevelopment projects with local taxes alone. Municipal redevelopment initiatives funded by TIF will be equitable for each taxpaying citizen if the costs for specific projects are clearly outlined.

Huddleston, J.R. 1986. Intrametropolitan financial flows under tax increment financing. *Policy Sciences* 19 (2): 143 – 161.

Municipal redevelopment expenses are funded through tax increment financing (TIF) by capturing the property tax revenues from county, school, and other local governments. When TIF is applied in a single metropolitan area by multiple local governments, tax shifting typically results. Huddleston evaluates the nature of tax shifting produced by TIF. This exercise reveals that TIF has the potential to negatively influence the financial situation of some taxpayers within the same metropolitan area. Data gathered from cities in Milwaukee County, Wisconsin reveals that TIF can generate tax shifting when applied in a large metropolitan area.

Johnson, C.L. 1999. Tax Increment Debt Finance: An Analysis of the Mainstreaming of a Fringe Sector. *Public Budgeting and Finance* 19: 47 – 67.

Federal tax policymakers have traditionally attempted to incorporate binding restrictions on the economic development bond market in the United States. However, this effort has been thwarted by the Tax Reform Act of 1986, which promotes less restrictive use of the economic development bond market particularly through municipal securities. Johnson

(1999) presents an evaluation of the economic development bond market by explaining tax increment financing (TIF). The results from an empirical analysis of TIF in California are also presented. Johnson's (1999) empirical analysis reveals that TIF is a growing sector of the economic development bond market. Local governments in many states are more frequently using TIF as a mechanism for raising capital. Results from the empirical analysis emphasize the distinctive characteristics of TIF. These characteristics are important for local governments to enhance the credit quality and minimize the financing costs associated with TIF.

Klemanski, J.S. 1990. Using Tax Increment Financing for Urban Redevelopment Projects. *Economic Development Quarterly* 4 (1): 23 – 28.

The majority of states within the US initiated overt and frequently aggressive tactics to attract private investment during the mid-1970s. Tax increment financing (TIF) originated from this movement and has become a commonly used financial incentive employed by local governments. Klemanski (1990) evaluates the merit of TIF as a mechanism for promoting private investment in economically depressed areas. The paper also discusses the political and financial consequences of TIF using state-wide case studies. At the publication date of this paper, TIF was permitted in 33 states. However, many of these states reported that TIF caused political, legal, and fiscal controversies typically focused on the equitable distribution of revenue.

Lawrence, D.B. and S.C. Stephenson. 1994. The Economics and Politics of Tax Increment Financing. *Growth and Change* 26 (1): 105 – 137.

Tax increment financing (TIF) is a common but controversial technique to fund urban redevelopment projects using property tax revenue. Using TIF, a local government is capable of influencing the tax bases of surrounding or overlapping jurisdictions. Since TIF effects the tax base of outlying jurisdictions, controversies typically flare with regards to who should actually fund the program. Lawrence and Stephenson (1994) explains a general method for determining which taxpayers should participate in funding TIF. Also, the paper presents a framework for implementing TIF as a beneficial program to taxpayers and urban redevelopment projects. An economic model was then applied to evaluate the outcomes from a TIF program in Des Moines, Iowa. Results from the model indicated that taxpayers were responsible for subsidizing downtown redevelopment in the initial years of the TIF program, but these same taxpayers eventually paid lower property taxes due to the TIF-financed downtown redevelopment program.

Man, J.Y. 1999. Fiscal Pressure, Tax Competition and the Adoption of Tax Increment Financing. *Urban Studies* 36 (7): 1151 – 1167.

Municipalities implement tax increment financing (TIF) as a tool for economic development. Man (1999) evaluates the types of municipalities that adopt TIF using a structural probit model populated by data retrieved from cities in Indiana. Results from the model indicated that municipalities consider variables such as financial pressures, tax

competition, economic distress, industrial property distribution, feasibility of alternative programs, and projected property value appreciation when designing a TIF program. The model also revealed that rapidly growing cities are not more likely to implement TIF.

Man, J.Y. and M. Rosentraub. 1998. Tax Increment Financing: Municipal Adoption and Effects on Property Value Growth. *Public Finance Review* 26 (6): 523 – 547.

Urban redevelopment projects administered by state and local governments have adopted various tax and financial incentives such as tax increment financing (TIF) since the 1970s. Property values typically remain the same while a TIF district is active. The study conducted by Man and Rosentraub (1998) indicates that TIF programs improve property value appreciation for properties in and surrounding the TIF district after the district has been dissolved.

Novak, T.L. 1999. Tax increment financing as a municipal revenue: helping the legislature get it right. *International Journal of Public Administration* 22 (11): 1615 – 1629.

Funds derived from tax increment financing (TIF) are traditionally used to improve public infrastructure in a designated urban redevelopment area. Despite obvious benefits, TIF has been involved in numerous intergovernmental controversies. TIF was approved by the state of Washington in 1982. As of 1999, cities within the state of Washington had yet to participate in a program funded through TIF. A trial program was activated to promote the funding potential of TIF and validate it in the eyes of the state supreme court. Novak (1999) evaluates the revenue generating mechanisms of TIF, the trial program discussed above, and the knowledge gathered from the sole TIF example in the state of Washington.

Weber, R. 2003. Equity and Entrepreneurialism: The Impact of Tax Increment Financing on School Finance. *Urban Affairs Review* 38 (5): 619 – 644.

Tax increment financing (TIF) is classified as an entrepreneurial economic development practice employed by local governments. It has been previously determined that TIF significantly impacts the fiscal conditions of overlapping tax jurisdictions. Weber (2003) conducted a statistical analysis of the impact that TIF has on school district finances in Cook County, Illinois. This analysis revealed that TIF diminishes school funding derived from property tax revenue. However, it was also determined that diminished school funds resulting from a TIF district are partially restored by increases in state school aid. Local government use of entrepreneurial economic development practices can result in conflict between independent tax jurisdictions if state or federal government does not shoulder some of the financial burden encountered through TIF.

Weber, R., S.D. Bhatta, and D. Merriman. 2003. Does Tax Increment Financing Raise

Urban Industrial Property Values? *Urban Studies* 40 (10): 2001 – 2021.

Weber et al. (2003) evaluated the influence of tax increment financing (TIF) on industrial property values in Chicago. Industrial properties situated in mixed-use TIF jurisdictions were typically appraised at a higher value than similar industrial properties not located in a TIF jurisdiction. Industrial properties situated in a strictly industrial TIF jurisdiction were not appraised at a higher value and sometimes received lower appraisal values than similar properties not located in a TIF jurisdiction. Industrial property values are positively influenced by mixed-use TIF jurisdictions because industrial property owners are more capable of converting to non-industrial uses.

Weber, R., S.D. Bhatta, and D. Merriman. 2007. Spillovers from tax increment financing districts: Implications for housing price appreciation. *Regional Science and Urban Economics* 37 (2): 259 – 281.

Tax increment financing (TIF) has been praised and criticized for its ability to rapidly raise residential property value. Weber et al. (2007) examines how TIF influences the appreciation of single-family residences in a Chicago neighborhood from 1993 to 1999. The study revealed that residences in close proximity to an industrial TIF jurisdiction experience a decrease in appreciation rates. Appreciation rates increased for residences in close proximity to mixed-use TIF jurisdictions that contain a variety of land uses. In the conclusion, the paper discusses the policy implications gathered from these findings.

Weber, R. and L. Goddeeris. 2007. *Tax Increment Financing: Process and Planning Issues*. Cambridge, Massachusetts: Lincoln Institute of Land Policy.

When tax increment financing (TIF) is applied, future revenue is assigned to ongoing expenses associated with urban redevelopment activities. During a time in which funds from other sources have been eliminated, TIF has generated revenue for municipal redevelopment initiatives. Weber and Goddeeris (2007) produced a primer that describes how TIF generates revenue and how TIF-generated revenue is allocated in a typical municipal context. The primer particular focuses on planning decisions during the preliminary and implementation phases. A hypothetical example is also provided to more clearly describe how TIF functions in a municipal context. Then, the authors examine the compatibility of TIF with different types of development projects by analyzing TIF case studies in a variety of municipal and fiscal contexts across the United States. Also, a literature review of TIF-related articles is performed to assess the overall perception of TIF. The authors conclude by formulating recommendations regarding the fair and equitable use of public funds generated by TIF.

Business Improvement Districts (BIDs)

Briffault, R. 1999. A Government for our Time? Business Improvement Districts and Urban Governance. *Columbia Law Review* 99: 365 - 394.

Due to its rapid acceptance and implementation, business improvement districts (BIDs) represent the most significant ongoing initiative in United States cities. BIDs have inspired controversy because the concept is inspired by a trend to privatize the public sector. Briffault (1999) argues that BIDs represent a balanced marriage between private and public interests. Through an examination of the legal and political structure related to BIDs, Briffault (1999) proposes the idea that BIDs are a hybrid of both public and private constituents. Furthermore, Briffault (1999) presents evidence to suggest that the interconnectedness between public and private elements has persisted as a longstanding tradition in local government law of the United States. Despite its resemblance to similar urban renewal strategies, BIDs represent a departure from customary democratic governance. Concern regarding BIDs is focused upon the equitable delivery of public amenities. Ultimately, BIDs are regulated by municipalities that can explore revenue generating alternatives for funding the improvement of public amenities. The quality of urban life can be significantly improved through the proper use of BIDs.

Gross, J.S. 2005. Business Improvement Districts in New York City's Low-Income and High-Income Neighborhoods. *Economic Development Quarterly* 19 (2): 174 – 189.

Business improvement districts (BIDs) have gained recognition as a tool for revitalizing commercial areas. Until Gross (2005), available literature typically discussed the outcomes of large BIDs established in wealthy urban areas. Gross (2005) presents qualitative and quantitative data describing 41 of New York City's BIDs ranging from small to large. From this analysis, the author was able to determine that small and large BIDs contribute to different development patterns. The physical maintenance of an area is typically fulfilled by a smaller BID, while a mid-size BID predominantly focuses on marketing activities. In addition to physical maintenance and marketing activities, large BIDs encourage the growth of capital funding sources. The manner in which a BID functions oscillates according to its resource base, types of commercial property within the district, key stakeholders, and the pre-existing wealth of the community.

Hoyt, L.M. 2005. Do Business Improvement District Organizations Make a Difference? Crime in and around Commercial Areas in Philadelphia. *Journal of Planning Education and Research* 25 (2): 185 – 199.

Urban renewal is an international effort that has widely accepted the controversial practice of business improvement districts (BIDs). Hoyt (2005) adds to the BID debate by presenting a conceptual framework evaluating the relationship between crime and public services accredited to BID. Both spatial and statistical techniques are used to estimate the influence of BIDs on unlawful activity. Results from these techniques imply that lower crime rates correspond to commercial areas with BIDs, and commercial areas without BIDs experienced higher crime rates. This result was not offset by inflated crime rates in areas directly surrounding a BID. Therefore, Hoyt (2005) concludes that urban areas with BIDs correlate to lower crime rates than urban areas without BIDs.

Lloyd, M.G., J. McCarthy, S. McGreal, and J. Berry. 2003. Business Improvement Districts, Planning and Urban Regeneration. *International Planning Studies* 8 (4): 295 – 321.

Local governments of the United States have widely accepted the use of business improvement districts (BIDs) for improving public amenities and urban renewal efforts. Recently, the United Kingdom has developed an interest in BIDs as a mechanism to enhance public amenities and urban renewal. In order for BIDs to be adopted in the United Kingdom, the administrative and social components of this urban renewal technique would have to be adapted. Operational issues related to BIDs were uncovered through the examination of various BID case studies in the Los Angeles area. However, the authors still recognize BIDs as a viable technique for renewing urban areas.

Mallett, W.J. 1994. Managing the post-industrial city: business improvement districts in the United States. *Area* 26 (3): 276 – 287.

Business improvement districts (BIDs) stimulate local urban economies through financial incentives. Mallett (1994) evaluates the role of BIDs in redeveloping central business districts of US metropolitan areas. The paper argues that BIDs influence the post-industrial geography of dilapidated urban areas. The services and regulatory structure of BIDs are discussed and the concept of special district local government is introduced. The author identifies spatial contradictions involving BIDs that are a component of larger redevelopment plans.

Mitchell, J. 2001. Business Improvement Districts and the "New" Revitalization of Downtown. *Economic Development Quarterly* 15 (2): 115 – 123.

Downtown areas are being revitalized throughout the United States. This effort has become increasingly focused on incremental and entrepreneurial tactics to redevelop dilapidated downtowns. The business improvement district (BID) has become a common method for revitalizing downtown areas. Mitchell (2001) discusses the influence of BIDs on downtown renewal by presenting the results from a national survey of 264 independently operated BIDs located in 43 states. The survey suggests that BIDs typically focus on marketing techniques, improving sanitation and security, and promoting public policies beneficial to downtown renewal. The research conducted for this paper indicates that BIDs are assuming an integral role in downtown rehabilitation because they focus on improving public amenities and conditions in downtown areas.

Mitchell, J. 2001. Business Improvement Districts and the Management of Innovation. *The American Review of Public Administration* 31 (2): 201 – 217.

Innovation has been recognized as a prominent concept in United States public administration. Innovative and responsive public administration methods are intended to improve the delivery of amenities and managerial efficiency. Business improvement districts are an example of an innovative public administration technique. Mitchell

(2001) performed a national survey of BID administrators to assess the relationship between BIDs and entrepreneurial management approaches. Approximately half of the BID administrators were staunch proponents of entrepreneurial activities. However, the alternate half were less concerned with innovative public administration strategies and more attentive to local political problems or supervisory tasks. Results from the survey indicate that BIDs provide the opportunity for public administrators to promote entrepreneurial activities and innovative management techniques if they so desire.

Schaller, S. and G. Modan. 2005. Contesting Public Space and Citizenship: Implications for Neighborhood Business Improvement Districts. *Journal of Planning Education and Research* 24 (4): 394 – 407.

Previous research has explored how business improvement districts (BIDs) can impose restrictions on the use of public space and citizenship. Schaller and Modan (2005) diverge from this research slightly by investigating BID resident perceptions of public space. This paper assesses the results from a participatory mapping project and BID resident messages provided through an email list to compare how residents ideally envision public spaces and how a BID proposes to manage public spaces. This comparative analysis revealed that urban planning projects can significantly differ from public perception of how open space should be used.

Enterprise Zone (EZ)

Papke, L.E. 1991. *Tax Policy and Urban Redevelopment: Evidence from an Enterprise Zone Program*. Cambridge, Massachusetts: National Bureau of Economic Research.

An enterprise zone (EZ) is defined as an economically depressed area selected for redevelopment through a combination of labor and capital tax incentives. EZs have been extensively used by both federal and state government, however, there have been limited statistical analyses performed to determine the effectiveness of EZs. Papke (1991) evaluates the influence of an Indiana EZ program on local employment and investment based on a sample of local tax jurisdictions. The results revealed that EZs in Indiana reduced unemployment claims by 19 percent and property values appreciated by 8 percent. Results from this analysis were proven to be statistically significant and supported urban redevelopment with EZs.

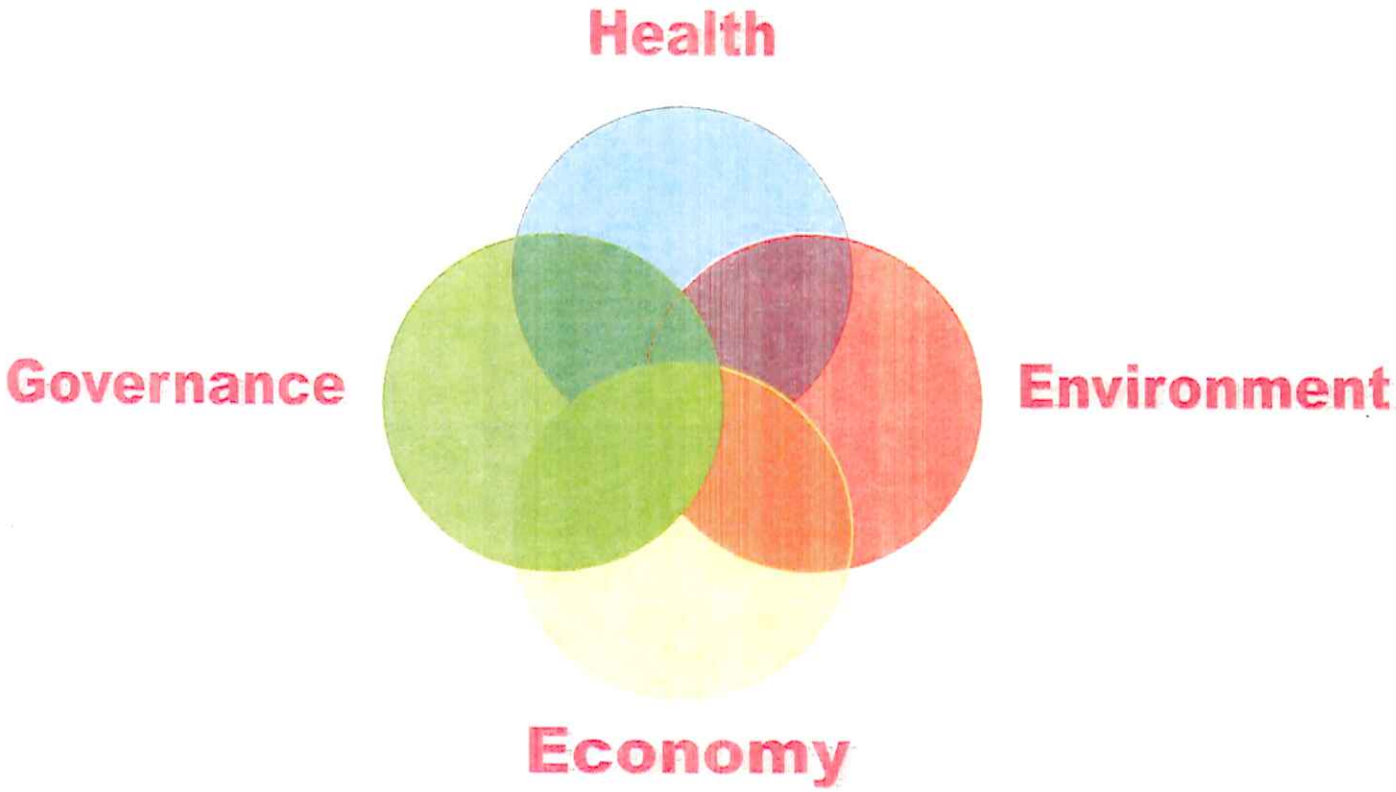
Appendix D

City of Clearwater BF Public Health Monitoring Project

City of Clearwater's Brownfields Public Health Monitoring Project

September 17, 2008
Clearwater, Florida

Suzi Ruhl, JD, MPH



Brownfields Redevelopment and Community Sustainability


Brownfields Assessment & Cleanup
Brownfields Redevelopment & Reuse
Brownfields Long-Term Management & Stewardship
CREATING COMMUNITY WEALTH THROUGH COMMUNITY HEALTH
Protecting Public Health & Safety

Brownfields Impact on Public Health

- *Social Economic* - blight, crime, reduction in the local social services
- *Environmental* - biological, physical and chemical from site contamination, groundwater impacts, waste dumped on site
- *Safety* - abandoned structures, open foundation, other infrastructure or equipment that may be compromised due to lack of maintenance, vandalism or deterioration.

Brownfields Redevelopment

Impact on Public Health

Purpose of the Project

Component of the City's brownfields program, which seeks to:

assess and redevelop brownfields sites in a manner that promotes community health, the environment and the economy

Federal Brownfields Law & Public Health Monitoring

Authority:

Local Governments can allocate 10% of Grant:

- Monitor health of population exposed to hazardous substances
- Monitor and enforce institutional controls to prevent exposure

What is Health Monitoring?

Definition:

"The collection of health - related qualitative and quantitative data of relevance to Brownfields communities and hazardous substance exposures"

EPA Brownfields Program per

Centers of Disease Control and Prevention

Public Health Monitoring: Types of Activities

Environmental

- examination of site access patterns to determine pathways of contamination
- mapping of site features that affect human exposure (e.g. private wells)
- monitoring of air, soil, and water during cleanup, reuse and long term stewardship
- collection of baseline environmental and health measures for planning

Public Health Monitoring: Types of Activities

Health

- examination of vital statistics in areas near brownfields sites
- monitoring health as part of community wide inventory activities
- asthma surveillance study
- lead screening at child care facilities
- assessing community progress in meeting Healthy People 2010 objectives
- planning and visioning to achieve optimal health reuse of brownfields
- Increase access to health care (e.g. health clinics)

City of Clearwater
Brownfields Public Health Monitoring Project "Kick-Off" Meeting
September 17, 2008
Group Discussion Questions

Topic: Community Health

Question 1: What are the major health concerns of the residents in Clearwater?

Question 2: How are these health concerns currently addressed within the community?

Question 3: What are sources of data which describe these challenges? What are sources of data that describe public health measures taken to address these challenges?

Question 4: Is there additional information on community health that you believe is relevant to brownfields redevelopment?

Topic: Environment

Question 5: What environmental health challenges exist in Clearwater?

Question 6: How are these environmental health challenges currently addressed within the City of Clearwater?

Question 7: What are sources of data which describe these challenges? What are sources of data that describe environmental health measures taken to address these challenges?

Question 8: Is there additional information on community health that you believe is relevant?

Topic: Brownfields Redevelopment

Question 9: What are ways in which brownfields redevelopment can address these issues?

Question 10: What are the corresponding community health benefits associated with brownfields redevelopment?

Question 11: What type of end use would you like to see when the brownfields sites in Clearwater are cleaned up and redeveloped?

Process Questions:

Question 12: What information would help you better understand brownfields redevelopment in Clearwater and how can it be provided to you in the most useful manner?

Question 13: What role would you like to play in addressing public and environmental health challenges through brownfields redevelopment?

Question 14: What next steps do you suggest?

Question 15: Are there others who are not here who should be involved?

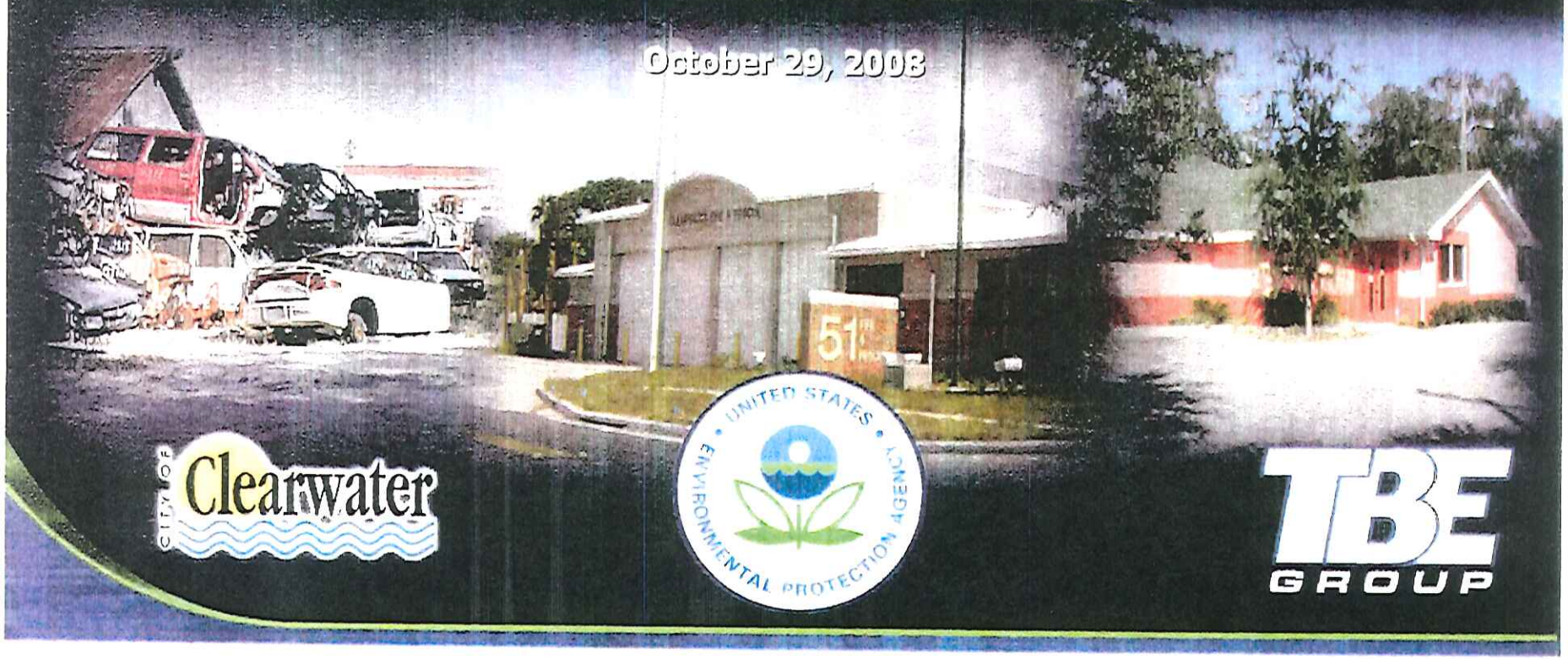
Prepared For

Clearwater Public Health Monitoring Project

Brownfields Advisory Board Meeting

Brownfields 101 & Clearwater Success Stories

October 29, 2008



CITY OF Clearwater

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

TBE GROUP

What are Brownfields?

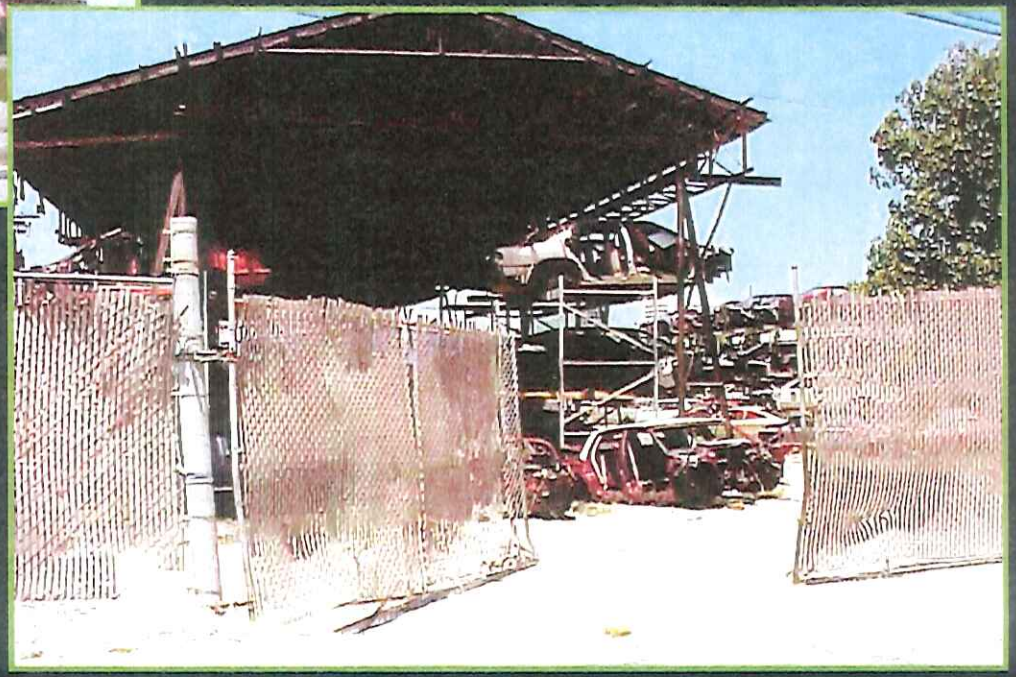
Brownfields are Real Property, the Expansion, Redevelopment, or Reuse, of which may be Complicated by Actual or **Perceived** Environmental Contamination.

Central Florida Auto Salvage – Clearwater, FL

Redevelopment Opportunities that Result in **Viable** Economic Development and Community Development, Residential and Open-space / Green-space Projects.

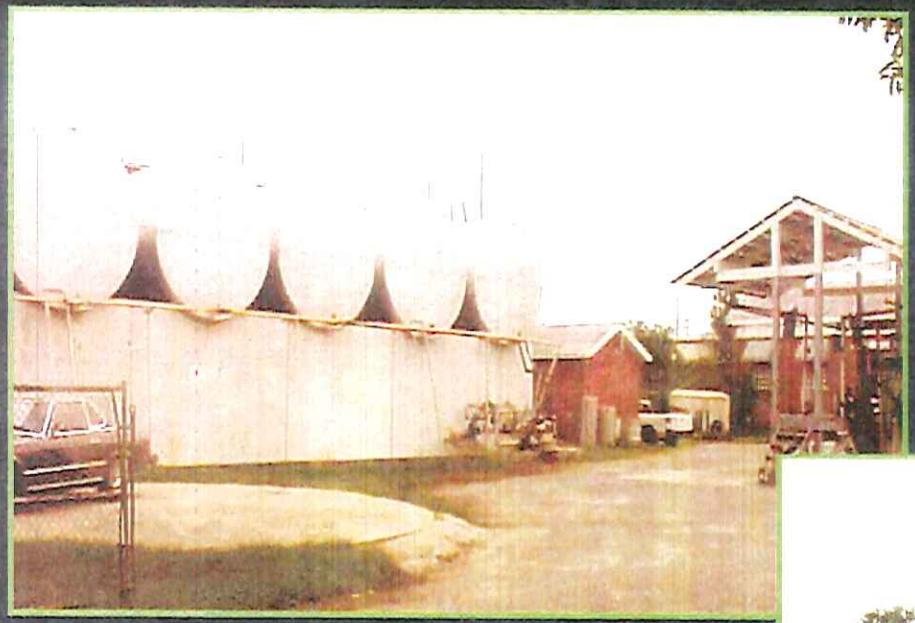
Brownfields Include

Solvent Contamination Sources –
Printers, Dry Cleaners, Auto Repair



Junk Yards

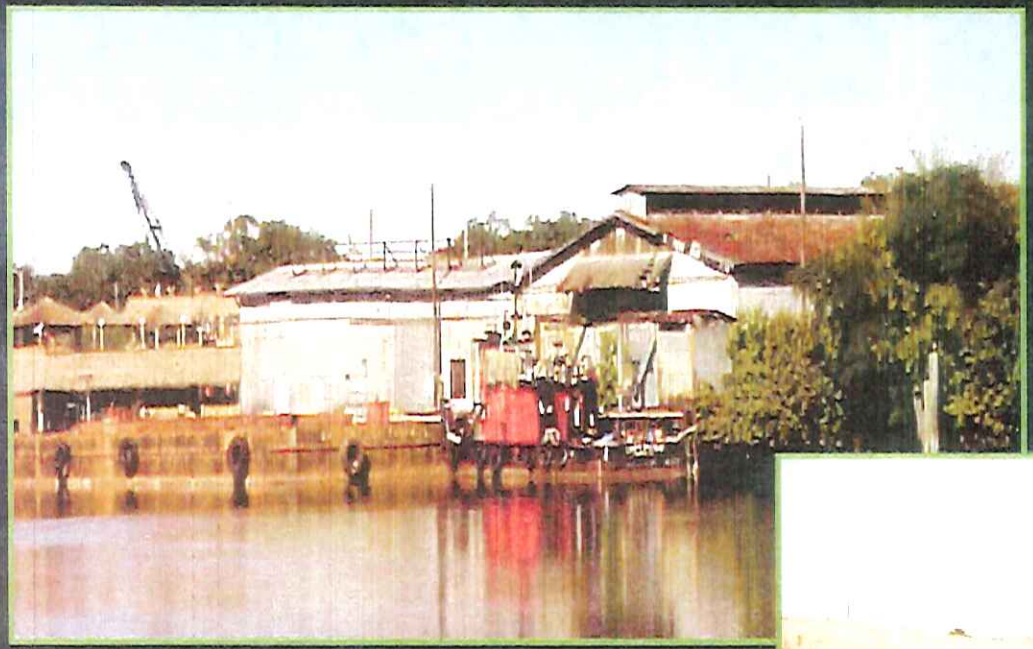
Brownfields Include



Petroleum Storage Sites

Corner Gas Stations

Brownfields Include



Marine Related Industries

Former Industrial Properties

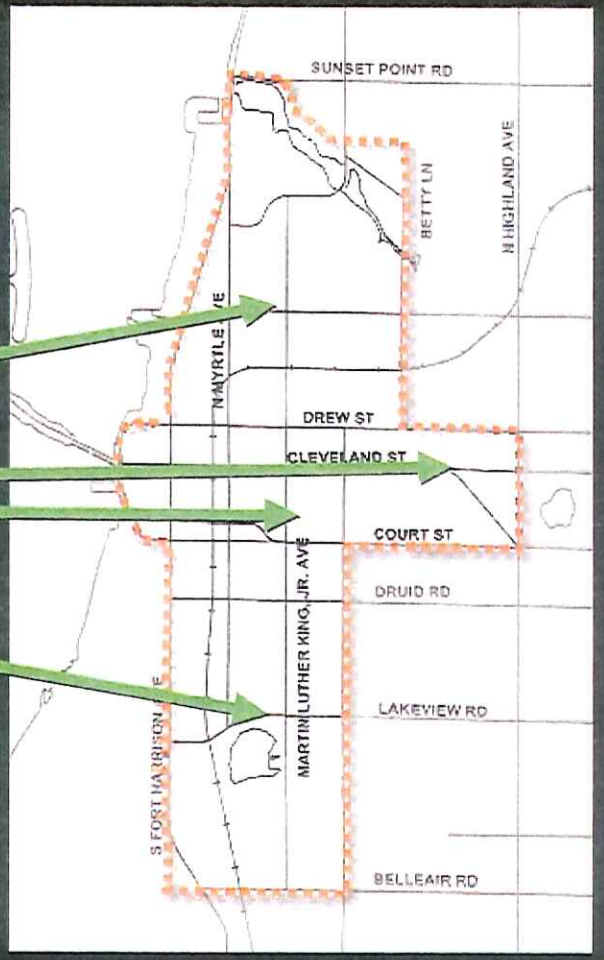
Brownfields Include

Former Landfills

Unexpected and
Adjacent Land Uses

Clearwater Background

- Clearwater Brownfields Area
  - 1,842 Acres/7,000 Properties
  - First State Designated Brownfields Area
  - North Greenwood Community
  - Gateway Area
  - Downtown/Community Redevelopment Area (CRA)
  - South Clearwater Communities
- Low Income and Minority Communities
  - 33.4% African American
  - 23.9% Hispanic and Growing



City of Clearwater

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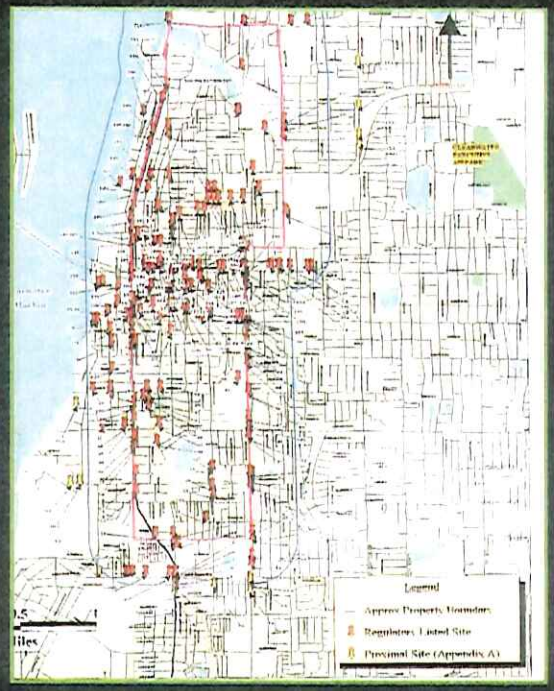
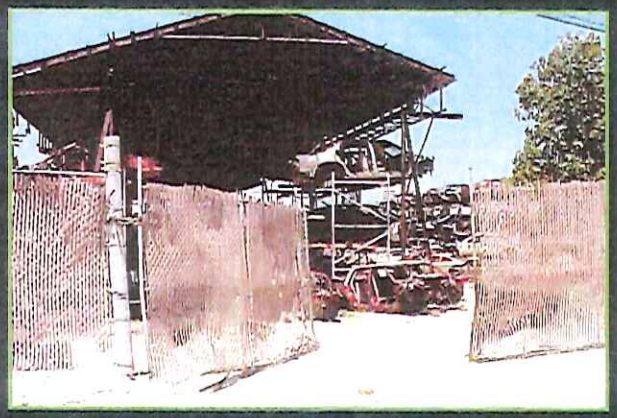
Clearwater Background

- 244 Regulatory Listed Sites
  - Abandoned Gas Stations
  - 100 Petroleum Contaminated Sites
  - Junk Yards/Car Lots
  - Dry Cleaners
  - Landfills





CITY OF Clearwater

TBE GROUP

Clearwater's EPA Grant Funding History

1997 - $100,000 EPA Assessment Grant (Regional)
1998 - $141,000 EPA Job Training Grant
1999 - $500,000 EPA BCRLF
2000 - $ 75,000 TBA Funding Stevenson Creek
2000 - $100,000 EPA Assessment Grant (Supplemental)
2001 - $ 55,000 TBA Funding Wolf Property
2002 - $150,000 EPA Assessment Grant (Supplemental)
2003 - $400,000 EPA Assessment Grants
2006 - $700,000 EPA BCRLF Supplemental Funding
2007 - $400,000 EPA Assessment Grants
2008 - $400,000 EPA Assessment Grants (Applying for funding)

$2,621,000 Total EPA Grant Funding

EPA Grants

- Brownfields Cleanup Revolving Loan Fund
  - Up to $1 Million Annually for Clean-Up and $1 Million Each for Coalitions
  - Supports Cleanup and Removal of Contamination from Communities

- Job Training
  - $200,000 Annually for Providers of Job Training
  - Provides Health and Safety Training for Residents (Environmental Technicians) within Brownfields Areas

TBE GROUP

EPA Grants to Support Public Health

- EPA Brownfields Assessment Grant
  - Up to $400,000 Annually to Local Governments and $1,000,000 for Coalitions
  - Can Be Used to Inventory / Identify / Assess and for Cleanup Planning Within Communities
  - Provides Assessment and Cleanup Planning to Support the Development of Health Care Facilities
  - 10% Can Be Used for Public Health Monitoring
- EPA Brownfields Cleanup Grant
  - Up to $600,000 Annually ($200,000 per site) to Local Governments or Non-Profits
  - Removes Contamination From Communities and Supports Health Care Related Redevelopment

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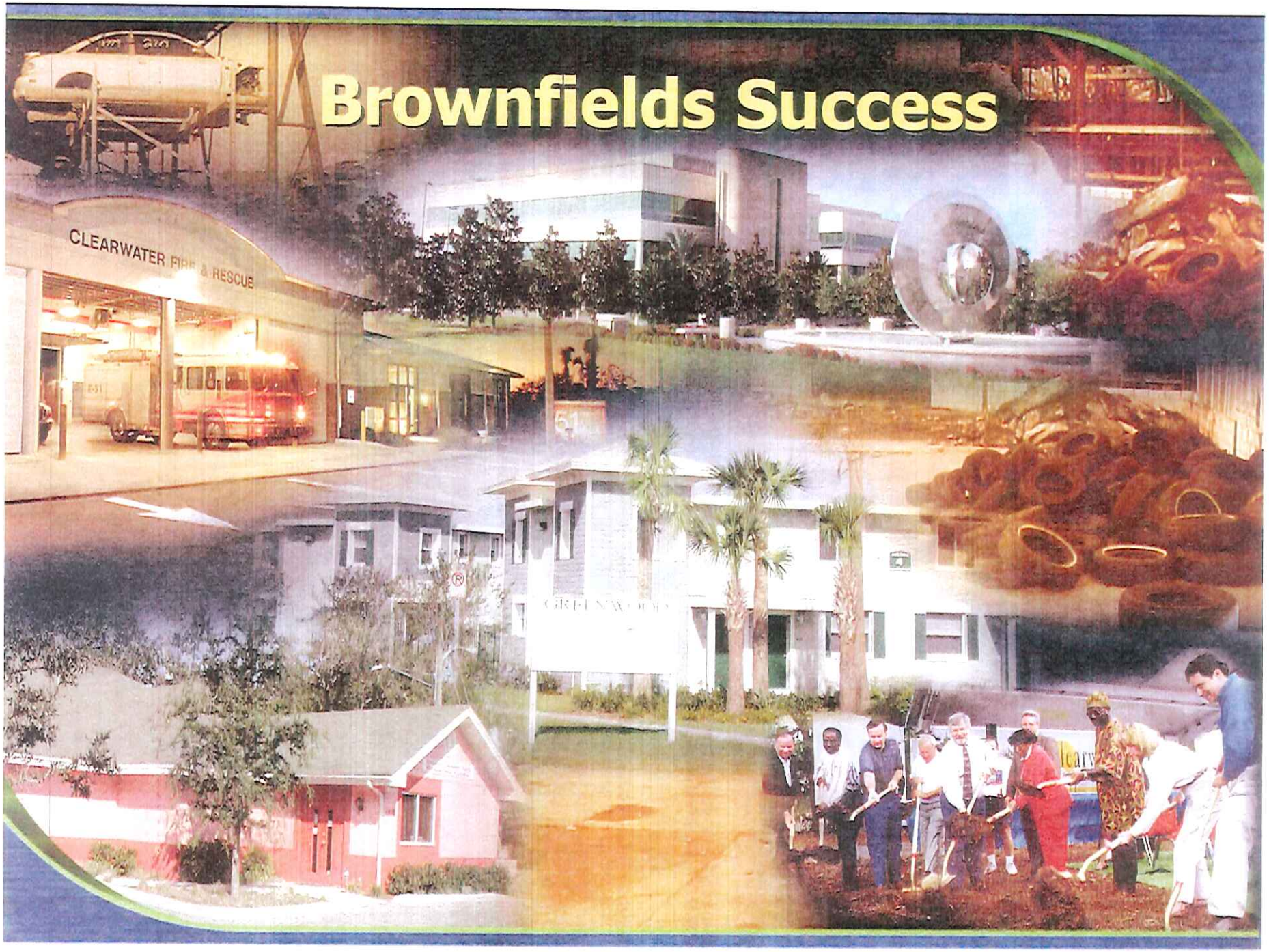
State Brownfields Incentives to Support Public Health

- Brownfields Bonus Refund
  - $2,500 for Each New Health Care Job in a Brownfields Area
- Building Materials Sales Tax Refund for Affordable Housing
  - Encourages Affordable and Workforce Housing Alternative to Sub-standard Housing with Lead and Asbestos Issues
- Voluntary Cleanup Tax Credit (VCTC)
  - Up to $500,000 Max Annually for Affordable Housing, Health Care Facilities, Eligible Solid Waste Removal Costs
  - Provides up to 75% Tax Credit on Cleanup for Health Care Facilities in Brownfields Areas
  - Targeted Site Assessments
  - Site Assessment / Cleanup to Identify and Remove Contamination from Communities
- Brownfields Loan Guarantee
  - Provides Loan Guarantee of up to 75% for Primary Lender's Loan for Affordable Housing / Health Care Providers and Facilities

eflorida
Enterprise Florida

TBE GROUP


Brownfields Success
CLEARWATER FIRE & RESCUE

CNHS Housing Project

Brownfields Challenge

- Mini-Junk Yard in Residential Neighborhood
- Inappropriate Land Use – Junkyard in Residential Community
- Environmental Injustice – Junkyard next to Infill Housing
- Hazardous Waste / Petroleum / Waste Oil / Arsenic in Soil

TBE GROUP

CNHS Housing Project

Brownfields Results

- 2 Quality Affordable Single-family Units
- Removed Contamination from the Community (Arsenic and Petroleum)
- Provides Alternative to Sub-standard Housing with potential Lead and Asbestos Issues
- Restore Fabric of Neighborhood

TBE GROUP

Greenwood Apartments / Palmetto Park

Brownfields Challenges

- Public Housing Appearance
  - Blight
  - High Crime / Police Response
- Asbestos Issues
  - Floor Tile, Glue Under Sinks, Window Glazing
- Lead Issues
  - Lead Based Paint
  - Encapsulated

Clearwater

Bank of America

Greenwood Apartments / Palmetto Park

Brownfields Results

- 192 Totally Remodeled Units
- Neighborhood Renaissance
  - New North Greenwood Library
  - New North Greenwood Park and Recreation
  - Streetscape
- Removed Asbestos and Lead in a CDC Lead High Hazard Area
- Provides Safe Housing Alternatives

Bank of America

Clearwater

Central Florida Auto Salvage

Brownfields Challenges

- Junkyard for over 40 years
- Low Income and Minority Area
- Junk Yard In Your Back Yard
  - Environmental Justice and Equity
- Potential Impacts to Stevenson Creek
- Fire Department Emergency Response Times
- Community Expectations for Stevenson Creek Restoration

City of Clearwater

TBE GROUP

Central Florida Auto Salvage

Brownfields Results

- Northwest Fire Station
- Improve Emergency Response Times to Underserved Community – (Improving Life Safety)
- Remove Environmental Blight from the Neighborhood
- Removed Potential Contamination Sources from Adjacent Residential Community and Stevenson Creek

CITY OF Clearwater

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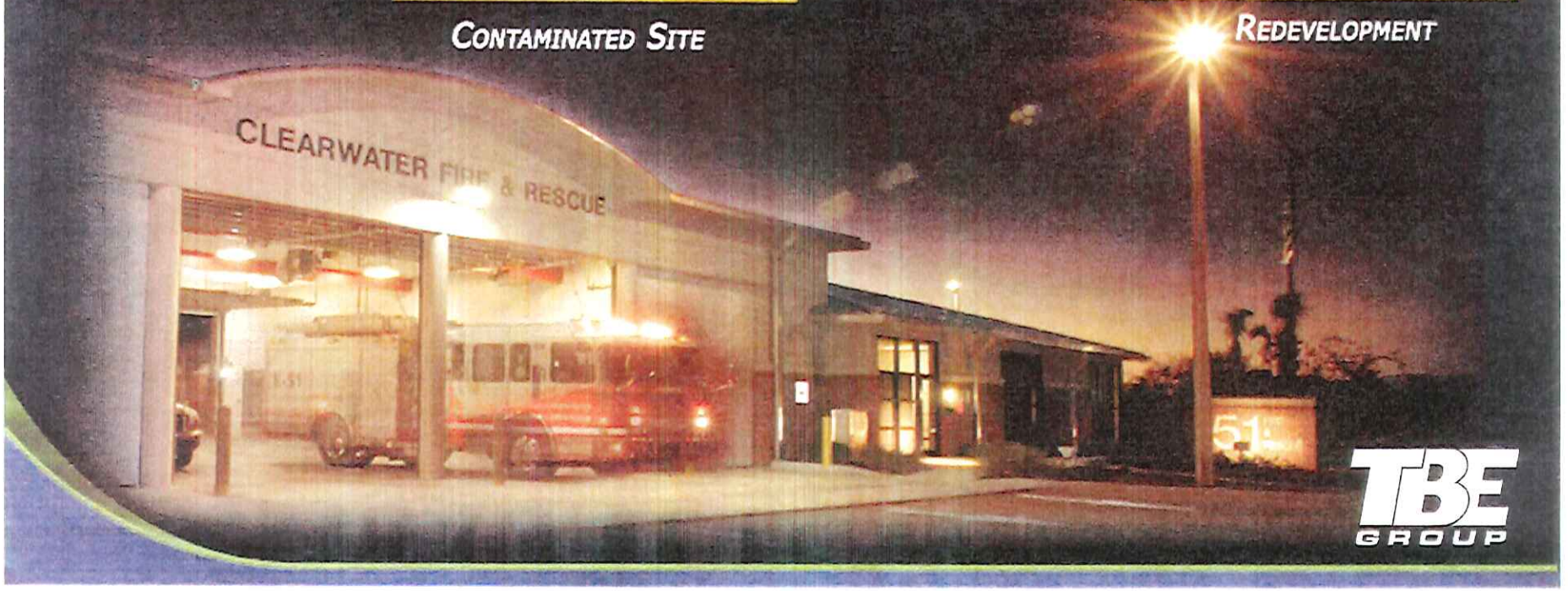
Brownfields Transformation

FORMER JUNKYARD

CONTAMINATED SITE

DEMOLITION & REMEDIATION

REDEVELOPMENT



TBE GROUP

Willa Carson Community Health Resource Center

Brownfields Challenges

- Needed for location for Health Care Provider for Underserved Community
- Abandoned Gas Station with Out of State Property Owner
- Environmental Issues
  - 500-Gallon Waste Oil Tank
  - 4000-Gallon Gasoline UST
  - 2000-Gallon Gasoline UST
  - 500-Gallon Kerosene UST
  - Hydraulic Lift
  - Oil-Water Separator
  - 450 Tons of Contaminated Soil

City of Clearwater

Willa Carson Community Health Resource Center

Brownfields Result

- Vision of Ms. Willa Carson
- Removed Contamination and Blight from Low-Income Minority Community
- Provides Free Health Care to Underserved Community
- Provides Health Care for over 4000 uninsured annually
- National Brownfields to Public Health Model

City of Clearwater

TBE GROUP

Brownfields Transformation

City of Clearwater

TBE GROUP

Thank You!

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Economic Development & Housing Department
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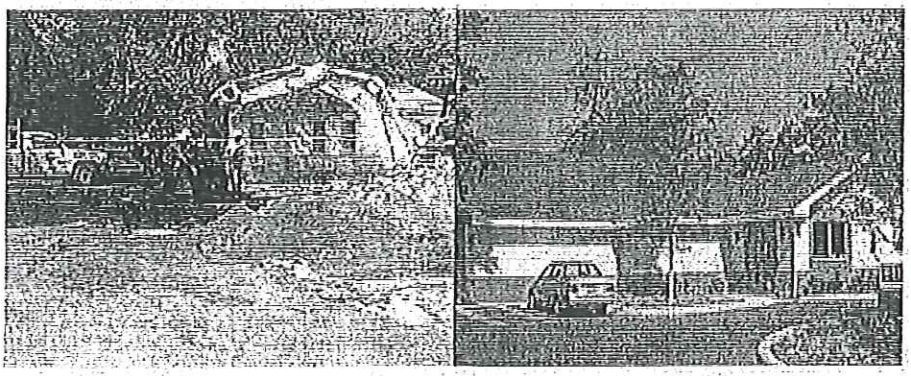
City of Clearwater
Brownfields Public Health Monitoring Project "Kick-Off" Meeting

EPA Brownfields Assessment Grant
Cooperative Agreement
BF#96486307-0

A summary report of key findings of a Facilitated Dialogue held on September 17, 2008



Willa Carson Health Resource Center

Table of Contents

Introduction

Brownfields are vacant lots, abandoned gas stations, under-utilized warehouses, former factories and other eyesores that may reduce the environmental, economic health and well-being of the community. The Clearwater Brownfields area is spread across more than 1,842+ acres with approximately 244 regulatory listed sites located in over 7,000 properties. Brownfields redevelopment helps restore sites to productive and beneficial use through site assessment and cleanup, redevelopment and reuse, and long-term management and stewardship. By integrating public health with brownfields redevelopment, the physical, mental, social and spiritual well-being of individuals, families and the community can be improved.

Through its Brownfields Assessment and Redevelopment Program, the City of Clearwater is conducting a Public Health Monitoring Project. This project provides important opportunities to strengthen public health assets through brownfields redevelopment. Tangible benefits of brownfields redevelopment can include health clinics, community gardens, parks and recreational areas, and health related businesses (e.g. pharmacies, diagnostic centers). To capture these opportunities, an initial first step is substantiation of community health and other needs. Public health monitoring offers a variety of tools that can be used to identify the public health needs that may be addressed through brownfields redevelopment. These include mapping of site characteristics, examination of vital statistics and monitoring of health and environment (e.g. asthma surveillance, lead abatement), among other measures.

The City of Clearwater's Brownfields Assessment and Redevelopment Program is made possible in part by a grant from the US Environmental Protection Agency. The Public Health Monitoring Project is being lead by Diane Hufford, City of Clearwater; Miles Ballogg, TBE, Inc., and B. Suzi Ruhl, JD, MPH. These individuals comprise the Public Health Monitoring Team.

Background

On September 17, 2008 a Facilitated Dialogue was held at the Clearwater Library for community health care providers, hospital representatives and other public health advocates. The purpose of the Facilitated Dialogue was to:

- Introduce the City of Clearwater's Public Health Monitoring Project
- Listen and learn from health care leaders about area's health challenges and resources
- Identify next steps to improve public health through brownfields redevelopment

The Facilitated Dialogue was comprised of two parts. The first part provided an overview of brownfields redevelopment, highlighted successful community based brownfields redevelopment projects, and explained the public health monitoring project. In fact, The City of Clearwater is a national leader in this area, having established the first free health clinic serving disadvantaged populations in the State's first designated brownfields area. The PowerPoint presentations on these topics are provided as Appendix A. The second part involved a discussion designed to gain insights from public health and medical leaders about health challenges faced by communities in Clearwater, including disease burdens, environmental concerns and redevelopment interests. Ultimately, the Facilitated Dialogue sought to engage the community health sector in efforts to plan and implement the public health monitoring project of the City of Clearwater's Brownfields Program. The agenda for the Facilitated Dialogue and the questionnaire used to guide the discussion can be found in Appendices B and C.

Methods

To implement the Facilitated Dialogue, several measures were taken. The first crucial task involved identifying key health leaders. The following significant efforts were undertaken to secure participation by essential community public health and medical leaders. First, the Public Health Monitoring Team determined the nature of the audience that would most benefit from the Facilitated Dialogue. Second, The City of Clearwater through personal contact and networking developed a master list of twelve (12) key public health advocates in Clearwater and the surrounding community. These community health leaders were selected based on their background in the field and their role in exchanging information related to the needs of the affected public. All were personally invited and each

was sent a letter to participate in the public health monitoring project workshop. Ultimately, a total of eleven (11) individuals participated in the Facilitated Dialogue on September 17th, 2008.

The second major task involved the design of the Facilitated Dialogue. This task was completed by the Project Team, who informed their deliberations with literature reviews and consultation with national leaders in the field.

Results of the Facilitated Dialogue

The Facilitated Dialogue involved discussion of a carefully designed list of questions developed by the Public Health Monitoring Team. These questions are provided in Appendix C. During the dialogue, the predominant focus was on health needs throughout the City of Clearwater. The results of the Facilitated Dialogue discussion are provided below.

Topic: Community Health

Question 1: What are the major health concerns of the residents in Clearwater?

The participants identified numerous challenges facing community health in Clearwater. These challenges can be categorized according to disease, capacity, and patient dynamics.

Disease and Health Impact on Population

- Mental health
- Dental care
- Preventive health care

Capacity of Provider

- Use of emergency room for clinical and primary care
- Lack of care options after working hours and at night
- Need for outpatient and inpatient wound care services
- Lack of funding and other resources, with a special challenge on how to best spend limited resources
- Long term operation and sustainability of the health care facility, beyond construction costs

- Lack of state approved beds at assisted living facilities (i.e. availability and qualifying for subsidy)

Patient Dynamics

- Recurrent challenges of a county indigent health care system, including:
  - access (i.e. distance/buses)
  - language barriers (e.g. Spanish, Laotian)
  - affordability, especially for ages 18-64
- Changing dynamics of patient population
  - moving north(middle and working class)
- Shift in racial and ethnic background (i.e. shift from predominantly African American to Hidalgo Mexican)
- Accessing health care in crisis/critical care mode with lack of utilization of preventive measures
- Novices accessing the system

Question 2: How are these health concerns currently addressed within the community?

The participants provided information based on the efforts of the organizations and institutions with whom they work. While an extension presentation of the full services provided by these institutions is not included in this document, highlights are summarized below:

Clearwater Free Clinic (CFC), which works with Morton Plant: This center sees 12,000 people/year and addresses health maintenance, with a special focus on chronic disease (e.g. diabetes). It uses client care workers. They ask for $10 donation. Morton Plant provides services such as x-rays, and other laboratory procedures.

Homeless Emergency Project (HEP): This project also provides services similar to the CFC. The hospital staff assists HEP but there are gaps, especially as they relate to dental care. The participants discussed the role of the VA in providing mental health services. Special issues related to PTSD and homeless issues were raised.

Willa Carson Community Resource Center: This center provides free primary health care to residents of the North

Greenwood community, and others who are uninsured and underserved. It also provides screenings, vaccinations, and educational programs.

The participants also discussed other health issues.Regarding mental health, the participants indicated that such patients are sent to the St. Petersburg Emergency Room center because there are no facilities located in Clearwater. Finally, the participants discussed health care in Hillsborough County, which has a special funding source based on a tax for surgeries performed within the County.

Question 3: What are sources of data which describe these challenges? What are sources of data that describe public health measures taken to address these challenges?

The participants identified numerous sources of data which are essential in understanding the nature of the health challenges facing diverse populations in Clearwater. There are several important surveillance and tracking efforts underway in Clearwater. The sources and type of data include:

- Emergency room use data is collected by HEP
- Information on work days saved though the provision of medical care is collected by HEP
- Individual health plans document the need for a "medical home"
- HEDIS (health employer data information system) is a data set that addresses needs related to nutrition, body mass index, and lifestyle changes among other attributes.
- CFC has information on hypertension, diabetes, and asthma and offers education/classes
- Turley has information on transients and patients with little or no insurance. Their information includes hospital, referrals, clinic use, diabetes, asthma, nutritional, Spanish interpreter.
- In general, core measurements include diabetes, congestive heart failure, stroke, and prevention
- In general, the number of no shows is being tracked, with the data showing the increased need for prevention

Question 4: Is there additional information on community health that you believe is relevant to brownfields redevelopment?

The Pinellas County Health Department provided additional information of potential sources of data related to community health. Data available by zip code includes:

- Number of births by age/race
- Low/very low birth weight
- Infant Deaths
- Total deaths
- Number of STDs by type
- Reportable diseases (primarily infectious diseases, but some data on heavy metals)
- Lead poisoning (it should be noted that there are few reported events – only 3 children under 6 and 22 persons total have tested positive for lead this year per Merlin).
- Cancer deaths/cancer cases (this information would probably need to be requested from the Florida Department of Health. Again, the number of events would probably be too small unless "all cancers" for several years was used. Usually, multiple cancer types do not indicate a strong association with environment.
- General demographic data (race, age, income, etc.) is available from US census bureau which can be obtained by zip code from the website.

With respect to number of births by age/race, low/very low birth weight, and infant deaths, information can be provided for the number of clients seen in the CHD for the various program areas by zip code. WIC also shows their clients by zip code. An additional possible source of data is 911 call data. While, these are typically emergency issues, this information can be used for violence prevention statistics. It was also noted that if the data request is aggregate for several years, it is possible to get more data by zip code because the number of events would be larger.

The health department also identified critical limitations in the availability of local data smaller than a zip code level. It is only in rare cases that data available for areas smaller than zip code level is available.

Further, the health department explained additional constraints. Most of the time requests for health outcomes related to the environment are not defined by a zip code. In general the health department is not allowed to distribute data by geographic area if there are less than 3 events (e.g. deaths, disease).

Finally, the health department addressed overall data limitations. Most of the time when people from the community want health outcomes data, they want data that is not reportable by law. The cancer database is an exception. County level cancer data can be obtained from the website. However, zip code level data may require a request from the State Department of Health.

Topic: Environment Health

Question 5: What environmental health challenges exist in Clearwater?

While the participants primarily focused on health challenges in Clearwater, the most significant environmental health challenges identified were:

- Lead
  - in older homes
  - in eating utensils used by the Hidalgo population
- Asbestos
- Homeless live on streets, in abandoned warehouses. They need affordable housing

Question 6: How are these environmental health challenges currently addressed within the City of Clearwater?

The participants noted that these challenges have been addressed in part by government programs operated through the Pinellas County Health Department, such as the lead program. The City of Clearwater also has programs.

Question 7: What are sources of data which describe these challenges? What are sources of data that describe environmental health measures taken to address these challenges?

The participants again referred to government programs operated by the Pinellas County Health Department, especially those focusing on lead. Additional information is available through the Florida Department of Health and the Florida Department of Environmental Regulation.

Question 8: Is there additional information on community health that you believe is relevant?

The Pinellas County Health Department provided information on additional sources of data relevant to the environmental health of Clearwater. This information relates to petroleum tanks clean up and well surveillance information. In addition, the City of Clearwater has produced a Gateway 5 Year Plan which provides information on both challenges and opportunities.

Topic: Brownfields Redevelopment and End Uses

Question 9: What are ways in which brownfields redevelopment can address these issues?

The participants expressed the availability of land as a major need that could be addressed through brownfields redevelopment. They also discussed the string of stages involved in increasing capacity and access for health care. These include land identification and acquisition, construction of the building, and operation of the health care facility. They mentioned the role of job training through brownfields redevelopment. Currently the focus of brownfields job training does not address health care capacity. However, it was also noted that a case can be made that health care providers can play an important role in public health monitoring. Finally, they mentioned the role of brownfields redevelopment in addressing contamination of properties.

Question 10: What are the corresponding community environmental health benefits associated with brownfields redevelopment?

As stated previously, the participants suggested that brownfields redevelopment can benefit environmental health by abating soil,

water and air pollution, and reducing human exposure to contaminants.

Question 11: What type of end use would you like to see when the brownfields sites in Clearwater are cleaned up and redeveloped?

The following end uses were identified by participants as possible end uses:

- affordable housing on former junkyards and other brownfields properties, for homeless and other low income populations
- medical home, preferable one where most health care needs can be met in one place (e.g. PPOD model- pharmacy, podiatry, optometry and dental)
- dental facilities, including emergency and maintenance
- mental health facilities, beyond those that simply provide medical management
- Pinellas County Health Department needs property to relocate its Clearwater facility; it has a capital outlay of three years, but needs land. The County is also interested in developing a health campus that could provide multiple health services, including prevention and clinical care, job training, and education.
- surgery center

Topic: Engagement Process

Question 12: What information would help you better understand brownfields redevelopment in Clearwater and how can it be provided to you in the most useful manner?

The participants expressed interest in information that would clarify the status of contamination on brownfields sites. They were also interested in the costing out of brownfields sites.

Question 13: What role would you like to play in addressing public and environmental health challenges through brownfields redevelopment?

The participants expressed interest in learning more about specific opportunities to use brownfields properties as sites to meet their capacity needs. They also expressed interest in using brownfields redevelopment to leverage additional resources to meet these needs.

Question 14: What next steps do you suggest?

The participants recommended the following:

1) A summary of facilitated dialogue should be prepared.
2) Additional facilitated dialogues should be conducted, with the next dialogue after the summary is prepared and then quarterly thereafter.
3) Information should be provided that shows how the cost of a brownfields site is better than a non-contaminated site
4) Education should be conducted on monitoring of exposure to contamination, use of existing sources to address the life cycle of health care facilities, and other follow-up information.

Question 15: Are there others who are not here who should be involved?

The participants discussed other possible collaborators including those that provide social services. It was noted that the Department of Health and Human Services Coordinating Council was invited but unable to attend was. Additional information on other stakeholders will be developed as the process continues.

Recommendations and Future Work

Based on the findings and recommendations of the participants, possible recommendations can be suggested. These include the following:

1) Given the urgent financial challenges facing various community health providers, efforts must seek to increase the resources available rather than divide existing resources into smaller increments.

2) Opportunities for collaboration should be explored which will help strengthen all of the providers capacity to address health care needs of the population.
3) Preventive services are a crucial need
4) Brownfields sites, properly remediated, can provide important capacity to address health care needs.
5) Brownfields redevelopment can be used to leverage additional resources to meet the health and environmental needs of the community.

Conclusion

The Facilitated Dialogue with health care leaders in Clearwater provided important information that will be incorporated into a Plan of Action by the City of Clearwater. The dialogue is considered an initial measure to develop a collaborative effort that maximizes opportunities provided by brownfields redevelopment to improve community health, sustainability and well-being.

City of Clearwater
Brownfields Public Health Monitoring Project
Presentation to the City of Clearwater Brownfields Advisory Board
Summary

October 29, 2008

Introduction
The City of Clearwater is a national leader in promoting community health through brownfields redevelopment. Among other successes, the City helped establish the first free health clinic serving disadvantaged populations in the Florida's first designated brownfields area. The Willa Carson Community Resource Center is now an inspiration for communities throughout the country seeking to promote community health through brownfields redevelopment. The City of Clearwater is once again at the forefront of efforts to advance public health through brownfields redevelopment through its Public Health Monitoring (PHM) Project. This summary addresses the initial engagement of the City of Clearwater Brownfields Advisory Board with this new project.

Summary of the Meeting
On October 29, 2008, the PHM Team met with the City of Clearwater's Brownfields Advisory Board. The purpose of the meeting was threefold:

- introduce the PHM Project to the Board
- secure comments from the Board regarding implementation of the project
- obtain suggestions on potential end uses of brownfields redevelopment that would promote community and public health

The meeting was conducted in two parts: first, presentation of information; second, discussion of the implementation of the project.

Part One:
To introduce the PHM project, Miles Ballogg and Suzi Ruhl provided an overview of brownfields redevelopment; highlighted successful community based brownfields redevelopment projects; and, explained the PHM Project. The PowerPoint presentations on these topics are provided as Appendix A. The information presented is summarized below.

The City of Clearwater has a strong background in brownfields redevelopment. The City has identified 244 regulatory listed sites (e.g. abandoned gas stations, petroleum contaminated sites, junk yards, dry cleaners, landfills). The City has been extremely successful in obtaining funding to address these sites from the US Environmental Protection Agency (EPA). Since 1997, the City has received over 2.6 million dollars in grant funding for site assessment, site remediation, and job training.

The City has made significant progress in cleaning up brownfields sites and redeveloping these sites. Illustrations include:

- remediation of a mini-junk yard in a residential neighborhood into 2 quality affordable single-family units
- remediation of blighted public housing with lead and asbestos into remodeled units
- remediation of a junkyard into a fire station

- remediation of abandoned gas station into a free health clinic

The PHM Project is premised on the recognition that while brownfields may reduce the environmental, economic health and well-being of the community, brownfields redevelopment can restore sites to productive and beneficial use. This transformation is achieved through site assessment and cleanup, redevelopment and reuse, and long-term management and stewardship. By integrating public health with brownfields redevelopment, the physical, mental, social and spiritual well-being of individuals, families and the community can be improved.

Basically, the city is conducting the PHM Project through its Brownfields Assessment and Redevelopment Program. This project provides important opportunities to strengthen public health assets through brownfields redevelopment. Tangible benefits of brownfields redevelopment can include health clinics, community gardens, parks and recreational areas, and health related businesses (e.g. pharmacies, diagnostic centers). To capture these opportunities, an initial first step is substantiation of community health and other needs. Public health monitoring offers a variety of tools that can be used to identify the public health needs that may be addressed through brownfields redevelopment. These include mapping of site characteristics, examination of vital statistics and monitoring of health and environment (e.g. asthma surveillance, lead abatement), among other measures.

The City of Clearwater's Brownfields Assessment and Redevelopment Program is made possible in part by a grant from the US Environmental Protection Agency. The PHM Project is being lead by Diane Hufford, City of Clearwater; Miles Ballogg, TBE, Inc., and B. Suzi Ruhl, JD, MPH. These individuals comprise the Public Health Monitoring Team.

Part Two

Following the presentation of information, the PHM Project Team and the Brownfields Advisory Board engaged in a discussion designed to gain insights regarding public health challenges and opportunities to address those challenges through brownfields redevelopment. Issues addressed include:

- Environmental Challenges
  - Junkyards as a major problem
  - Pharmaceuticals in drinking water

- Potential End Uses
  - Community facilities
    - Recreational
    - learning
  - Health care facilities
    - Medical clinic for after hours-use
    - Campus with clinical care, prevention, job training
  - Community gardens
  - Education
    - Training location to do research on sustainable practices, incubation/laboratory for experiments (e.g. NASA)
    - Community learning center

- Housing
  - Student housing for St Pete College, to support nursing, fire, police students
  - Quasi dorms/quad lease; avoid single room occupancy
  - Homeless
  - Former foster youth
  - Tie to community development
- Job training
  - Youth
  - Health care field (e.g. nursing, pre-nursing)
- Sustainability
  - Green teams
  - what happens to a business on a contaminated property after it has been cleaned up (e.g. go out of business, move to a different location, apply pollution prevention)
  - nexus to transportation

- Additional potential stakeholders
  - faith based organizations (e.g. churches, Interfaith Coalition)
  - United Way
  - Environmental Advisory Board
  - PTEC
  - St. Petersburg College
- Regional workshop
  - This event will be conducted in collaboration with the East Tampa Brownfields Project for the purpose of highlighting progress and challenges in promoting community health through brownfields redevelopment.
  - Participants on the workshop planning committee from Clearwater include Diane Hufford, Miles Ballogg, Mike Flanery, Ryley Hunter and Sioux Hart.

Conclusion

Efforts to promote community health through brownfields redevelopment and the PHM project are on-going. The Brownfields Advisory Board maintains an important role in this process.

Appendix E

Info on Regional Workshops in Clearwater and East Tampa

WILLA CARSON COMMUNITY HEALTH CENTER

A SUCCESS STORY

The Center provides free access to valuable health care services and education to the surrounding community residents.

The site was an abandoned gas station and garage. The City purchased the property and site assessments determined that excessively contaminated soil existed at the site. Environmental issues addressed removal of a 500-gallon waste oil tank, a 4000-gallon storage tank, a 2000-gallon gasoline storage tank, a 500-gallon kerosene storage tank, a hydraulic lift, an oil-water separator and 450 tons of petroleum-contaminated soil.

A $1 a year 30-year land lease was provided by the City while a $300,000 state appropriation grant funded construction.

City of Clearwater
Economic Development and Housing
112 S. Osceola Ave.
Clearwater, FL 33756

COMMUNITY HEALTH AND BROWNFIELDS REDEVELOPMENT REGIONAL WORKSHOP

FEBRUARY 17, 2009
FEBRUARY 18, 2009

Co-Sponsored by the City of Clearwater and East Tampa
Funded by U.S. EPA Region 4

CITY OF Clearwater

REGIONAL FOCUS ON COMMUNITY HEALTH AND BROWNFIELDS REDEVELOPMENT

PURPOSE

- Learn about ongoing efforts to promote community health by leveraging Brownfields redevelopment
- Network with leaders in community health, neighborhood revitalization, government, business and philanthropy throughout the Tampa Bay Region
- Identify and engage potential resources in addressing health challenges
- Job training opportunities

CITY OF CLEARWATER OUTREACH SESSION

Where:
Willa Carson Community Health Center
1108 N. Martin Luther King Jr. Ave
Clearwater, FL 33755

When:
Tuesday, February 17, 2009

Time:
5:00PM (Registration)
5:30PM – 7:30PM (Workshop)

Event is free, limited to 65 people.
Advance registration is required.

Light refreshments will be served.

RSVP before January 30, 2009

City of Clearwater
Diane Hufford
Economic Development Coordinator
phone: 727-562-4054
fax: 727-562-4075
e-mail: diane.hufford@myclearwater.com

CITY OF TAMPA EAST TAMPA OUTREACH SESSION

Where:
Regan Park Community Center
1200 East Lake Ave
Tampa, FL 33605

When:
Wednesday, February 18, 2009

Time:
9:00AM – 4:00PM (Workshop)

Event is free, limited to 75 people.
Advance registration is recommended.

Light refreshments will be served.

RSVP before January 30, 2009

City of Tampa
East Tampa Development Department
Lorna Alston
Economic Development Specialist
3808 E. 22nd Street, Tampa, FL 33610
phone: 813-242-3808
fax: 813-242-3830
e-mail: lorna.alston@ci.tampa.fl.us

Community Health and Brownfields Redevelopment Regional Workshop

Co-Sponsored by the City of Clearwater and the City of Tampa

Willa Carson Health Resource Center
1108 N. Martin Luther King Ave
Clearwater, FL 33755
February 17, 2009

5:00 **Registration**

5:30 **Welcome**
George N. Cretekos, Vice Mayor
City of Clearwater

Introductions and Overview
Suzi Ruhl, JD, MPH

5:40 **Tour of the Willa Carson Community Health Center**

- Community Perspective
  Muhammad Abdur-Rahim, Willa Carson Health Resource Center
- Brownfields Area View
  Diane Hufford, City of Clearwater
  Miles Ballogg, TBE Group, Inc.
- Health Care Facility
  Annie Tyrell, Willa Carson Health Resource Center
  Mike Flanery, PE, MPH

6:10 **Increasing Capacity to Achieve Community Health Goals through Brownfields Redevelopment**

- Government Resources
  Matt Robbins, US EPA
- Philanthropy
  Ellen Stoffer, United Way
- Job Training
  Karen M. DesLauriers, Ultimate Medical Academy

6:50 **Public Health Monitoring Through Brownfields Redevelopment**

- Panel Presentation on Draft Plan of Action
  Miles Ballogg, TBE Group, Inc.
  Suzi Ruhl, JD, MPH
- Open Dialogue and Participant Discussion on Next Steps
  Cynthia Peurifoy, US EPA

7:30 **Adjournment**

Petroleum Contaminated Soil

Provision of Miss Willa Carson

Groundbreaking Celebration

Free Clinic Serving Over a 600 Square

TBE GROUP

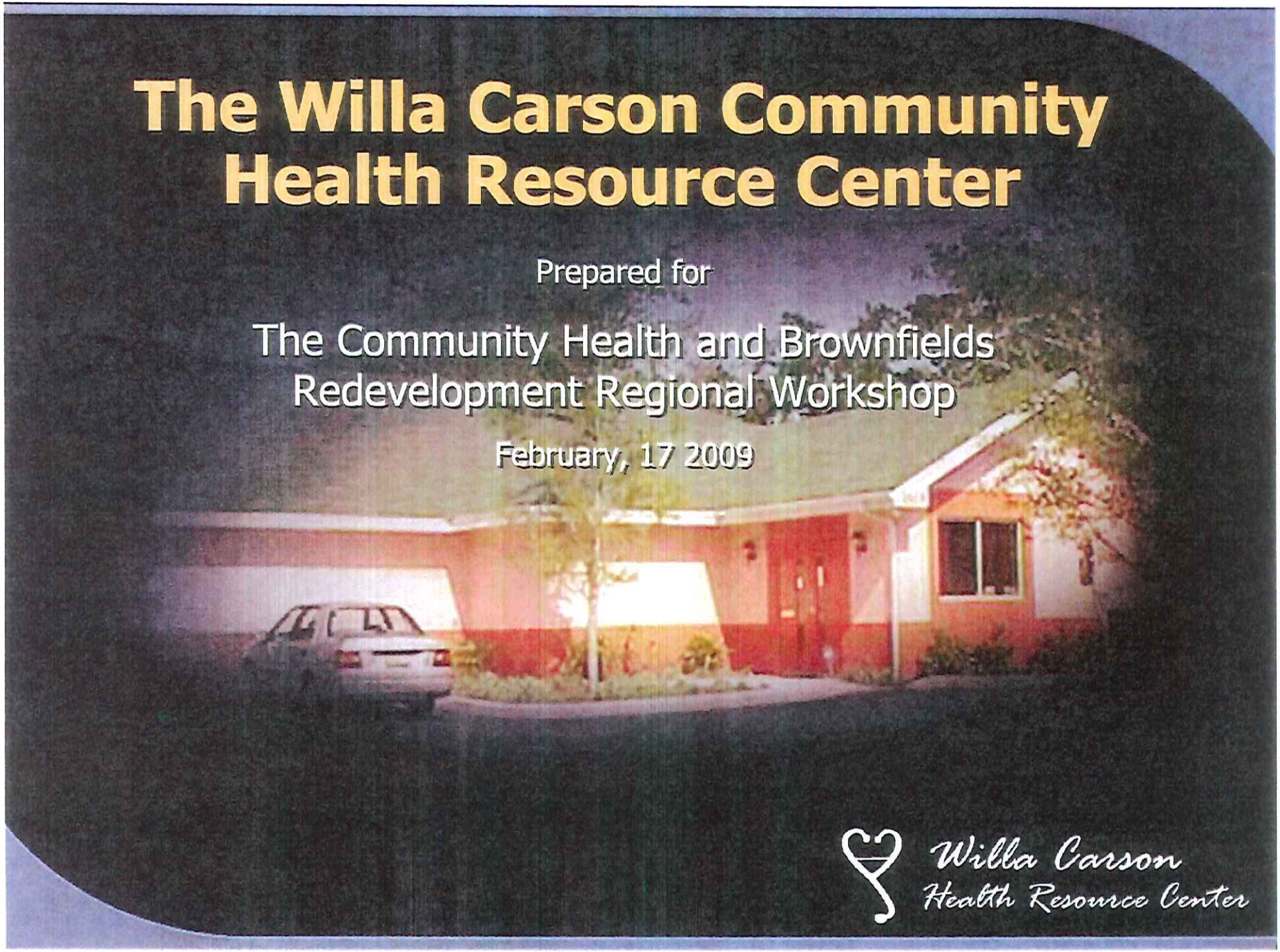
Project Funded with EPA Assessment Funds

The Willa Carson Community Health Resource Center

Prepared for

The Community Health and Brownfields Redevelopment Regional Workshop

February, 17 2009



Willa Carson
Health Resource Center

Community Perspective

- History
- Sustainability

Willa Carson
Health Resource Center

Who Are We ?

- Vision – Ms. Willa Carson
- Mission- Quality Health Care to Medically Underserved
- Governance- Board Of Directors

Willa Carson
Health Resource Center

What Do We Do

- Screenings
- Pregnancy Testing
- Early Diagnostics
- Primary Health Care
- Nutrition
- Health Education
- Health Resource Referrals
- Community Capacity Building

Willa Carson
Health Resource Center

How Do We Staff The Center

- Medical Director
- Medical Staff
  - Director
  - ARNP
  - Nurse
  - Medical Assistant
  - Case Manager
- Volunteers
  - Doctors
  - Medical Assistant

Willa Carson
Health Resource Center

Who We Serve

- 2006 Client Demographics
  - Male 29.56 %
  - Female 62.24 %
  - White 28.10 %
  - Black 42.30 %
  - Hispanic 15.45 %
  - Other 14.15 %
  - Adult 91.76 %
  - Children 8.24 %
- Number of Clients - 4,991

Willa Carson
Health Resource Center

Why The Willa Carson Community Health Resource Center ?

- Community Demographics
  - Predominantly African American
  - Growing Hispanic Population
  - Health Statistics
    - Infant Mortality Rate for Black Infants **2.6 Times** that of White Counterpart
    - Black Infants are **Twice** as Likely to be born with Low Birth Weight

Willa Carson
Health Resource Center

Brownfields Challenges

- Need for location for Health Care Provider for Underserved Community
- Abandoned Gas Station With Out of State Property Owner
- Environmental Issues
  - 500-Gallon Waste Oil Tank
  - 4000-Gallon Gasoline UST
  - 2000-Gallon Gasoline UST
  - 500-Gallon Kerosene UST
  - Hydraulic Lift
  - Oil-Water Separator
  - 450 Tons of Contaminated Soil

City of Clearwater

Brownfields Tools

- $150,000 State Brownfields Redevelopment Appropriations
  - Land Acquisition
  - Assessment / Tank Removals / Remediation
  - Impact Fees, Liens, Surveys, Appraisals
- First City Brownfields Rehabilitation Agreement
- NFA – Soil and Groundwater Issues
- $300,000 State Appropriation for Construction

City of Clearwater

Willa Carson Health Resource Center

Successful Community Based Healthcare

- Community Vision – Ms. Willa Carson
- Community Based / Community Driven
  - Unanimous Use for Site
- Pinellas County Health Department Partnership
- Improves the Quality of Life for the Community

Willa Carson
Health Resource Center

Challenges

- Sustainability
  - Grants
  - Non-Federally Qualified
  - Additional Partnerships
- Pharmaceuticals
- Demand to Serve the Uninsured

Willa Carson
Health Resource Center

Community Transformation

Petroleum
Contaminated
Site

Free Clinic Serving over
4,000 Uninsured Annually


Thank You
Muhammad Abdur-Rahim, Chairperson Board of Directors
727-562-4950 x7205
muhammad.abdur-rahim@myclearwater.com
Annie Tyrell, Center Director
727-467-9411
annie@carsonhrc.org
Willa Carson
Health Resource Center

Community Health and Brownfields Redevelopment Regional Workshop

Co-Sponsored by the City of Tampa and the City of Clearwater

Ragan Park Community Center
1200 East Lake Ave
Tampa, FL 33605

CITY OF Clearwater

February 18, 2009

9:00 Welcome and Introductions

- City of Tampa
  - *Ed Johnson, East Tampa Urban Development Manager*
  - *Mary Mulhern, Councilwoman, District 2 - At Large*
- City of Clearwater
  - *James R. Donnelly, Economic Development & Housing*

9:15 Overview of the Workshop

B. Suzi Ruhl, JD, MPH, Project Director

Community Driven Needs Assessment

Dr. Richard Briscoe, University of South Florida/ Health, Education and Social Service Committee of East Tampa Revitalization Partnership

9:30 Keynote Presentation

US Congresswoman Kathy Castor

10:00 Transforming Community Vision to Reality through Brownfields Redevelopment: Needs, Challenges and Opportunities

Moderator: Suzi Ruhl

Presentation of the Role Play

Convener: Lorna Alston, East Tampa Development Department

Panel Response: Highlighting Lessons Learned Government:

Matt Robbins, US EPA Region 4

Health:

Kathryn Bing, US Agency for Toxic Substances & Disease Registry
Gayle Guidash, Pinellas County Health Department
Faye Coe, Hillsborough County Health Department

Philanthropy:

Steve Lesky, Allegany Franciscan Ministries, Inc.

Business:

Miles Ballogg, TBE, Inc.

Petroleum Contaminated Site

Vision of Miss Willa Carson

Groundbreaking Celebration

Free Clinic Serves over 4,000 Under Insured

TBE GROUP

Project Funded with
EPA Brownfields Assessment Grant Funds

Community Health and Brownfields Redevelopment Regional Workshop

11:15 **Break** *Sponsored by TBE Group, Inc*

11:30 **Emerging Opportunities: Youth and Job Training**

- Building from Success: Connecting Youth and Job Training to Public Health Monitoring and Brownfields Redevelopment
  Patrick Barnes, BFA Environmental Services
- Exploring New Job Opportunities
  Karen M. DesLauriers, Ultimate Medical Academy
  Ellen Stoffer, United Way

12:30 **Lunch:** *Sponsored by TBE Group, Inc*
- Food Provided by The Urban Café

1:30 **Regional Plan of Action for Community Health through Brownfields Redevelopment Panel:**
Miles Ballogg, , Bob Brinkman, Suzi Ruhl, Chloe Coney, District Director, US Congresswoman Castor

- o Overview of the Public Health Monitoring Project
- o Mapping Community Challenges
- o Presentation of the draft Plan of Action
- o Q&A Session

Break : *Sponsored by USF Center for Brownfields Rehabilitation*

Group Exercise on the Plan and Reporting: Framework for Progress Convener:
Cynthia Peurifoy, US EPA Region 4

4:00 **Closing and Adjournment**
Suzi Ruhl, Lorna Alston and Chloe Coney

TBE GROUP

Project Funded with
EPA Brownfields Assessment Grant Funds

COMMUNITY HEALTH THROUGH BROWNFIELDS REDEVELOPMENT:

A Community Listening Session to Shape Your Neighborhood Vision

September 18, 2008
Tampa, Florida

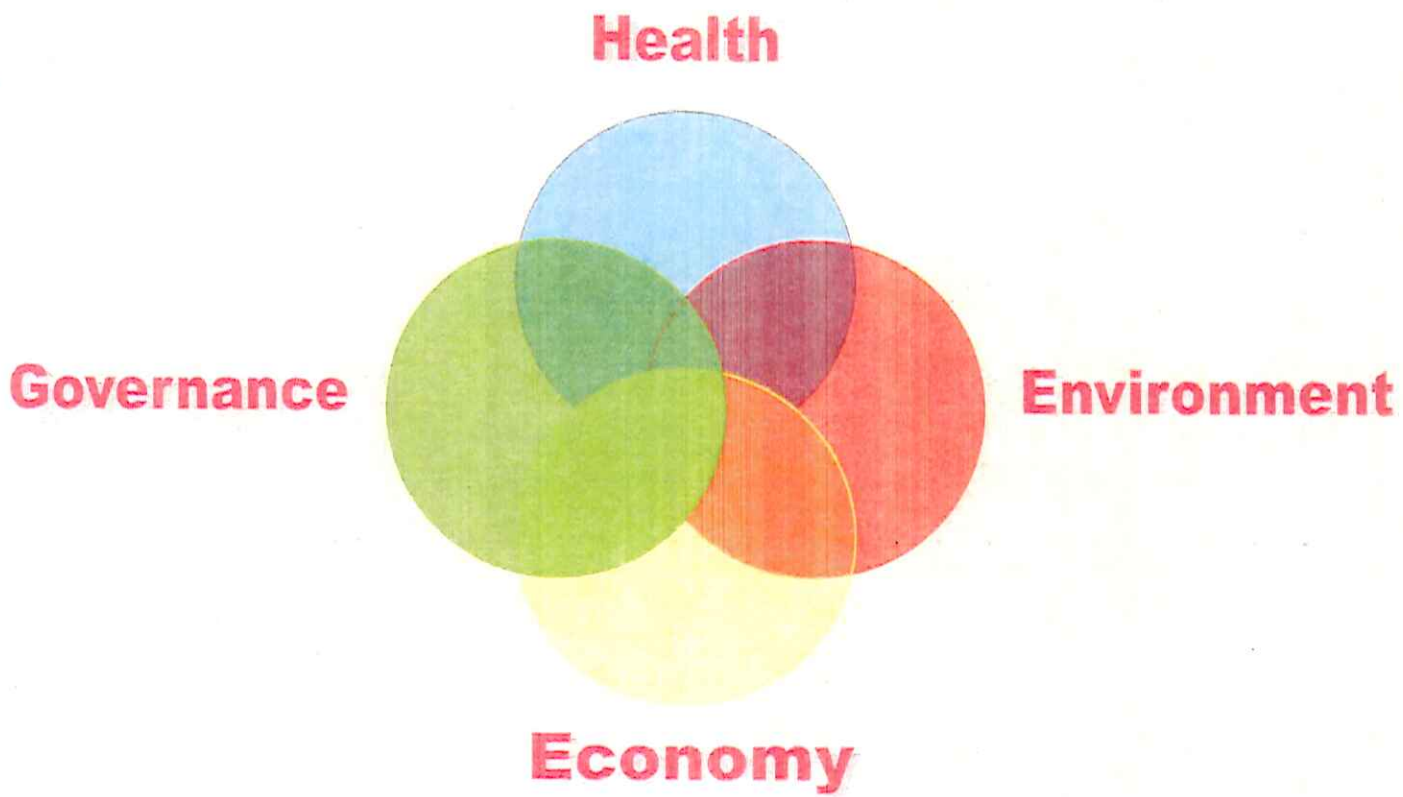
Destination of the Brownfields Public Health Monitoring Project

Routes to Our Destination

- Engagement of stakeholders
- Education on brownfields and health issues
- Assessment of challenges and resources
- Plan of action
- Collaborative implementation and evaluation

Our Roadmap for Tonight

- **Introduction: *Brownfields Public Health Monitoring Project***
  - Brownfields basics
  - Community success stories
  - Job training
  - Public health monitoring
- **Listen and learn from the community**
  - Challenges
  - Existing resources
- **Identify next steps**

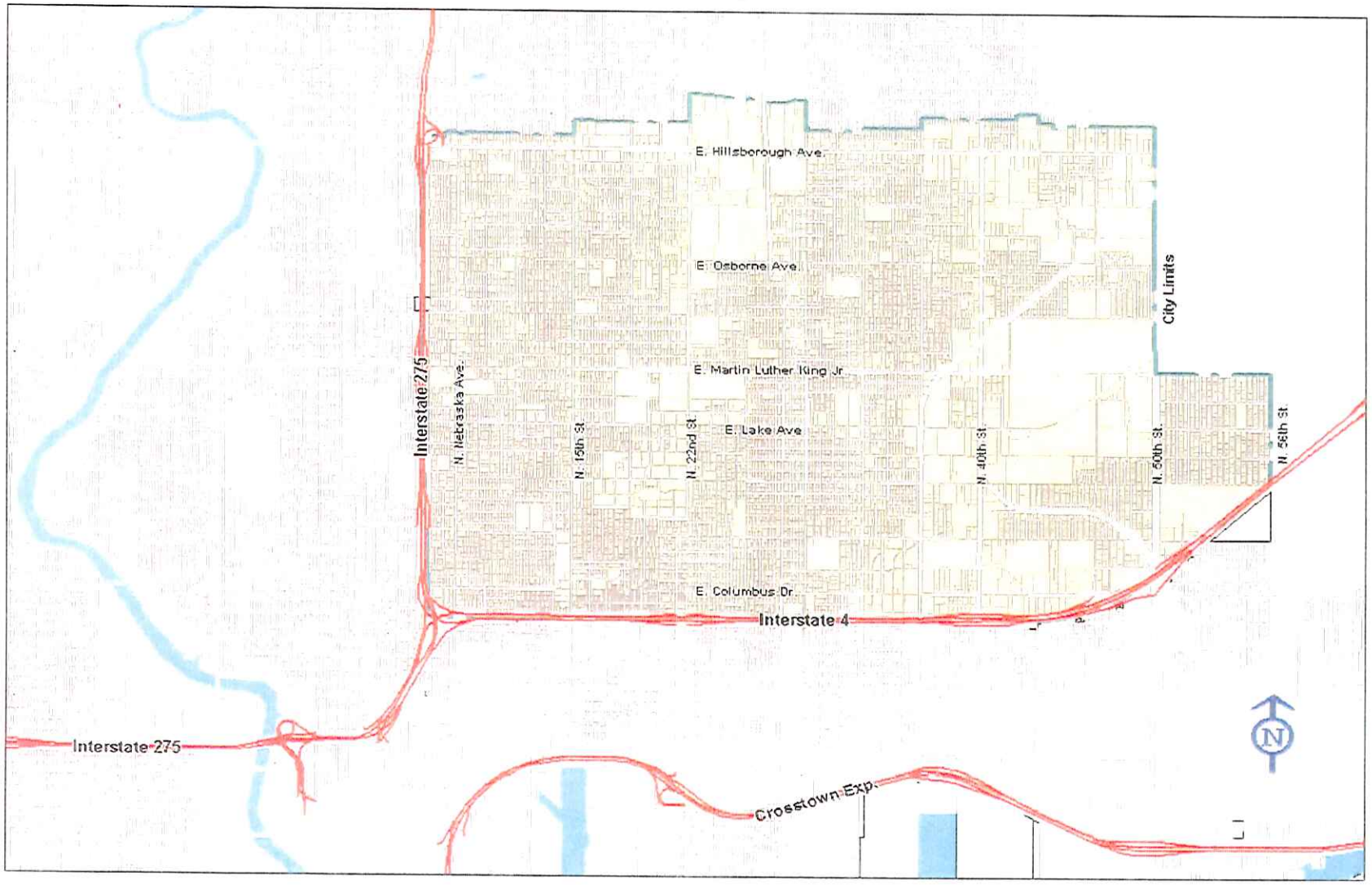


Brownfields Redevelopment and Community Sustainability

Brownfields Public Health and Health Monitoring

East Tampa Target Area

East Tampa CRA



What is Brownfields

Real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or ***potential*** presence of a hazardous substance, pollutant, or contaminant


Brownfields Assessment & Cleanup
Brownfields Redevelopment & Reuse
Brownfields Long-Term Management & Stewardship
CREATING COMMUNITY WEALTH THROUGH COMMUNITY HEALTH
Protecting Public Health & Safety

Brownfields Impact on Public Health

- *Safety* - abandoned structures, open foundation, other infrastructure or equipment that may be compromised due to lack of maintenance, vandalism or deterioration.
- *Social Economic* - blight, crime, reduction in the local social services
- *Environmental* - biological, physical and chemical from site contamination, groundwater impacts, waste dumped on site

Cleaning up Brownfields properties

- Address safety or environmental concerns at the site
- Provide an opportunity for communities to create safer, healthier communities through the redevelopment process and use of smart growth principles

New Focus on the impacts of Brownfields

- Disadvantaged communities
- Sensitive population

Brownfields law allows

- 10% ($40,000) of the Brownfields grant can be used for:
  - Monitoring the health of population exposed to one or more hazardous substances from brownfields site
  - Monitoring and enforcement of controls to prevent human exposure to any hazardous substances from a brownfields site


Presentation to:
EAST TAMPA
East Tampa Public Health Monitoring Project
September 18, 2008
TBE GROUP

Why Brownfields to Public Health?

- Underserved Communities are Also Medically Underserved
- Environmental Liability to Public Benefit – From Environmental Blight to Public Health Right
- True Community Benefit
- Potential Market for Health Care End-Use
- Proof that the Brownfields Program is for Real!

TBE GROUP

Willa Carson Community Health Resource Center

Brownfields Challenges

- Need for location for Health Care Provider for Underserved Community
- Abandoned Gas Station With Out-of-State Property Owner
- Environmental Issues
  - 500-Gallon Waste Oil Tank
  - 4000-Gallon Gasoline UST
  - 2000-Gallon Gasoline UST
  - 500-Gallon Kerosene UST
  - Hydraulic Lift
  - Oil-Water Separator
  - 450 Tons of Contaminated Soil

CITY OF Clearwater

Willa Carson Community Health Resource Center

Brownfields Results

- Vision of Ms. Willa Carson
- Removed Contamination and Blight from Low-income Minority Community
- Provides Free Health Care to Underserved Community
- Provides Health Care for over 4000 Uninsured Annually
- National Brownfields to Public Health Model

City of Clearwater

TBE GROUP

Greenwood Apartments / Palmetto Park

Brownfields Challenges

- Public Housing Appearance
  - Blight
  - High Crime / Police Response
- Asbestos Issues
  - Floor Tile, Glue Under Sinks, Window Glazing
- Lead Issues
  - Lead Based Paint
  - Encapsulated

Clearwater

Bank of America

Greenwood Apartments / Palmetto Park

Brownfields Results

- 192 Totally Remodeled Units
- Neighborhood Renaissance
  - New North Greenwood Library
  - New North Greenwood Park and Recreation
  - Streetscape
- Removed Asbestos and Lead in a CDC Lead High Hazard Area
- Provides Safe Housing Alternatives

City of Clearwater

Bank of America

Old Mercy Hospital

Brownfields Challenges

- Six-Acre Brownfields Site
- Former African American Hospital During The Era Of Racial Segregation (1923)
- Site Lost Accreditation and Patients as other Health Care Options Became Available
- On Site/Off Site Underground Storage Tanks

Johnnie Ruth Clarke Health Center

Phenomenal Results

- State-of-the-Art Federally Qualified Health Care Center
- Broad-Based Collaborative Partnership
  - Community Health of Pinellas – Manages Facility
  - Bayfront Medical Center – Multiple Service Provider
  - FAMU - Pharmacy Program
  - University of Florida - Dental Program
  - American Heart Association
- NATIONAL PHOENIX AWARD WINNER

TBE GROUP

Brownfields Transformation

City of Clearwater

TBE GROUP

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Thank You!

Public Health Monitoring & Mapping

Suzi Ruhl, JD, MPH

Federal Brownfields Law & Public Health Monitoring

Authority:

Local Governments can allocate 10% of Grant:

- Monitor health of population exposed to hazardous substances
- Monitor and enforce institutional controls to prevent exposure

Definition:

"The collection of health - related qualitative and quantitative data of relevance to Brownfields communities and hazardous substance exposures"

EPA Brownfields Program per Centers of Disease Control and Prevention

Public Health Monitoring: Types of Activities

Environmental

- examination of site access patterns to determine pathways of contamination
- mapping of site features that affect human exposure (e.g. private wells)
- monitoring of air, soil, and water during cleanup, reuse and long term stewardship
- collection of baseline environmental and health measures for planning

Public Health Monitoring: Types of Activities

Health

- examination of vital statistics in areas near brownfields sites
- monitoring health as part of community wide inventory activities
- asthma surveillance study
- lead screening at child care facilities
- assessing community progress in meeting Healthy People 2010 objectives
- planning and visioning to achieve optimal health reuse of brownfields
- Increase access to health care (e.g. health clinics)

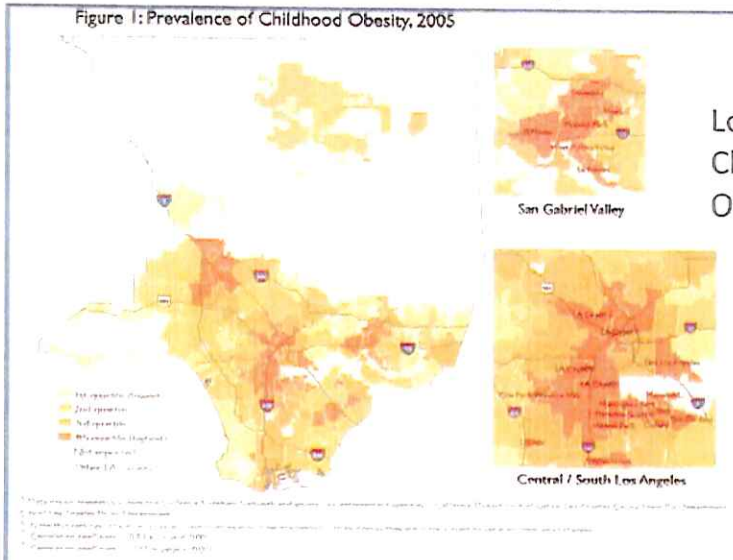
Brownfields Redevelopment

Impact on Public Health

Baltimore-Multiple Indicators

Jill S. Litt, Nga L. Tran, and Thomas A. Burke, 2002

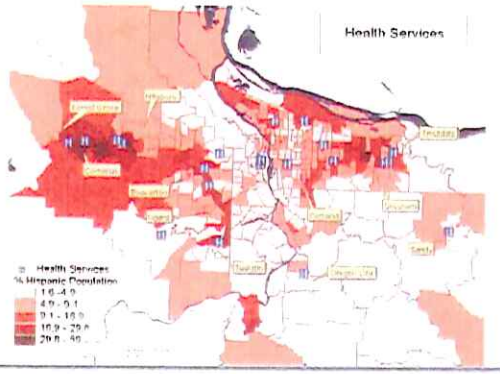
Mapping of health statistics helps understand the impact of brownfields within a community and helps to identify community needs.



Los Angeles—Childhood Obesity

California Center for Public Health Advocacy, An Epidemic: Overweight and Unfit Children in California Assembly Districts (Dec. 2002).

Portland-Location of Health Services by Hispanic Population



Health Services Report for Portland, Oregon, College of Urban and Public Affairs, 2008